

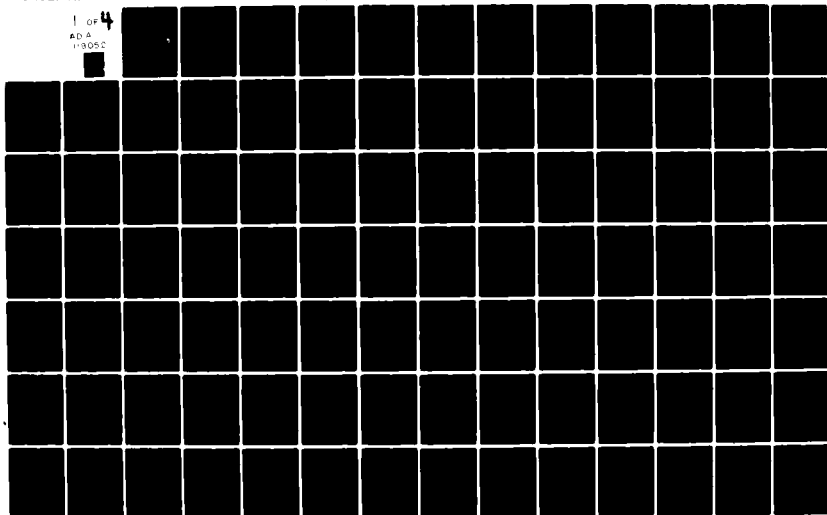
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Abstract of Dissertation

WORK REDESIGN AND THE JOB CHARACTERISTICS
MODEL: A LONGITUDINAL FIELD STUDY

by

Dean Holbrook Wilson, Ph.D.

United States International University

Committee Chairperson: John D. Donoghue, Ph.D.

THE PROBLEM. Jobs that are dull, repetitive, and seemingly meaningless cause personal and work problems, and many organizations are turning to work redesign to solve these problems. The purpose of this study was to perform a work redesign project in a military organization. It attempted to determine whether work redesign was possible in such a setting and if the application of the Job Characteristics Model (JCM) of work redesign would lead to positive personal and organizational work outcomes. 4

METHOD. The research was a six month field experiment which investigated the perceived amount of core job characteristics and critical psychological states reported by 78 Marine security guards prior to and following work redesign. Their general job satisfaction, internal work motivation, job performance, conduct, and absenteeism, as well as the moderating effect of individual growth need strength were also investigated. The Job Diagnostic Survey was used to diagnose the focal job prior to its

redesign, and to evaluate the effects of work redesign. Following the identification of the experimental and control groups, a management seminar and employee workshops were conducted to discuss the major concepts of the JCM and its implementing principles. The workers then participated in identifying work problems and suggesting changes to their jobs.

RESULTS. The data provided strong support for the JCM, and demonstrated that work redesign produced positive personal and organizational work outcomes. From these results, the following conclusions were drawn: (1) work redesign can increase employee job satisfaction and internal work motivation and improve conduct and job performance, (2) the diagnostic phase is the most essential part of a work redesign project, (3) the duties of the supervisors must also be changed so that their work grows in meaning and responsibility, (4) workers can successfully participate in determining how their jobs should be changed, and (5) individual growth need strength is a good measure of psychological readiness for enriched work and has implications for work assignment.



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WORK REDESIGN AND THE JOB CHARACTERISTICS
MODEL: A LONGITUDINAL FIELD STUDY

A Dissertation
Presented to the
Graduate Faculty of the
School of Human Behavior
United States International University

In Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
in Leadership and Human Behavior

by
Dean Holbrook Wilson
San Diego, 1982

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A Dissertation

Presented to the

Graduate Faculty of the

School of Human Behavior

United States International University

by

Dean Holbrook Wilson

Approved by:

John D. Donoghue April 30, 1982
Chairperson Date

William F. Zimbeck Jr. Paul Fleamper
Dean

Edward C. Brennan

DEDICATION

For my mother, Oral A. Wilson,
my appreciation for her love,
inspiration, and support
from the beginning.

For my father, George E. Wilson (1914 - 1976)
in loving memory.

ACKNOWLEDGMENTS

This was a long and difficult study, and I am extremely grateful to many people for their contributions and support. I am especially thankful for my association with Dr. John D. Donoghue, a true gentleman and scholar, as well as my friend and mentor. I particularly appreciated his help and encouragement, for without his guidance, constructive advice, and scholarly suggestions, this project would not have taken form. I would like to thank Anna Acitelli-Donoghue for her friendship, support, suggestions for improvements in style, and patience while reading through numerous drafts of this dissertation. I wish to express sincere thanks to the other members of my committee, Dr. William J. Zombeck, Jr., and Dr. Edward C. Brennan, for their encouragement and guidance. I felt especially privileged having such distinguished scholars on my committee.

A special thanks must be extended to the Marine security guards who willingly participated as subjects for this study, and to their commander, Captain Thomas C. Richardson. Captain Richardson's enthusiastic acceptance of work redesign and his willingness to break with tradition and encourage change were the reasons for this project's success.

Most of all, I wish to express my love and appreciation for my wife, Lorraine. She gave of herself and her time far beyond what was expected of her in encouraging, supporting, and finalizing this dissertation.

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Chapter 1

THE PROBLEM

This study was a six month field test of the Job Characteristics Model (Hackman and Oldham, 1980) which investigated the perceived amount of core job characteristics and critical psychological states reported by 78 United States Marine security guards prior to and following a work redesign project. The affective and behavioral responses of the guards to work redesign in terms of general job satisfaction, internal work motivation, job performance, conduct, and absenteeism, as well as the moderating effects of individual growth need strength were also investigated. An important aspect of the research was the fact that the burden was not placed on management to identify work problems, but instead included the job incumbents in both job problem identification and job change suggestions.

Organizational productivity and employee alienation from work have become problems of increasing importance in recent years. The past decade reverberated with blue collar blues, white collar woes, and Detroit's bust. Some experts argued that the United States was in the midst of a crisis in the world of work--one that had its roots in the design of jobs suited more for robots than

for mature, adult human beings. Proponents of this viewpoint noted that work organizations steadily increased their use of technology and automation, work became dramatically more specialized, simplified, standardized, and routinized, and work organizations became larger and more bureaucratic (Hackman and Lee, 1979).

At the same time, there was a general increase in the affluence, education, and level of aspiration of individuals in American society. The labor force was younger and better educated, and the "affluent society" generated higher levels of expectations (Barbash, 1976). As a result, many people wanted jobs that allowed them to make greater use of their education, that provided "intrinsic" work satisfaction, and that met their expectations that work should be meaningful. The nation may have arrived at a point at which the way that most organizations functioned was in conflict with the talents and aspirations of the people who worked in them (Hackman and Lee, 1979). Jobs that offered little challenge or autonomy, that were dull, repetitive, and seemingly meaningless, caused discontent among workers across all occupational levels.

Increasingly, therefore, organizational scientists viewed job enrichment or work redesign as a strategy for change that would lead to more meaningful jobs and an improvement in the quality of work life. The benefits of improving the quality of life at work included healthier, more satisfied, more productive employees, and more

efficient, adaptable, and profitable organizations. Work redesign included designing jobs with more variety, giving the employee more feedback on job performance, and providing opportunities for meaningful work experiences (Ivancevich and Etzel, 1979). It attempted to change the work behavior itself so that workers acquired a positive attitude about their work, the organization, and themselves. True efforts at improving the quality of work life involved carefully designed and implemented programs of planned change to the work itself so the employees would move from extrinsic motivation to genuine internal work motivation (Rosenbach, 1977).

This was a study of work redesign in a highly structured, rigidly hierarchical military organization. The research that is described in subsequent chapters of this report attempted to show a causal relationship between work redesign and employees' affective and behavioral responses to their enriched work. It also attempted to answer the question of whether work redesign was possible in such a setting, where immediate obedience and strict discipline were mandatory.

Background

Mindell and Gorden (1981) stated that the most important change affecting employee behavior in recent years was a shift in the meaning and value of work. Work itself did not change rapidly enough to keep up with the

wide scale changes in worker attitudes, aspirations, and values. It became accepted to note the passing of the "Protestant work ethic." Traditional values were declining; no longer could employers assume a lifetime of service and loyalty from workers. The work force changed and a "New Breed" of worker emerged, one who sought self-fulfillment, fun, challenge, and freedom in the work place. Coleman (1980) noted that critics of the industrial revolution, a century ago, looked with horror at the new values of acquisitiveness and declining interest in nonmaterial things. More recently, the "New Breed" of workers were viewed by older managers with the same dismay because they sought a "quality of work life," indeed a quality of life, that was not preeminently predicated on full immersion in the job, higher salaries, and career advancement.

Workers wished to get more out of a job than the traditional rewards. In a survey of work attitudes, Renwick and Lawler (1978:55) found that

people have in mind a level of compensation that they consider adequate for them. If their pay falls below this level, then money becomes more important than interesting work. If wages or salary are above this level, then whether they consider their job interesting assumes more importance.

Coleman (1980) argued that the psychic emphasis of individuals in the work force was shifting. It was shifting from a negative fear of want to a positive "quality of work life," in which employees could attain or maintain a self-image of responsibility for their lives and a distinction

between what they were doing and what could be done by a machine. Personal satisfaction and a sense of accomplishing something of importance to the enterprise, of a contribution made to which a person could point with pride, was coming to rival money and assigned status as individual incentives.

It would be simplistic, of course, to label the change in work values as the major villain behind America's anxiety over productivity, but it would be equally inappropriate to think of a resurgence in productivity occurring without a major realignment in one's approach to employee values and motivation (Mindell and Gorden, 1981). It is important, then, to develop a better understanding of the dynamics of motivation, work ethics, and values as they affect on-the-job behavior.

Statement of the Problem

Because of a general increase in education and an accompanying rise in affluence and level of aspiration of individuals in the United States, many people wanted jobs that allowed them to make greater use of their education, that provided "intrinsic" job satisfaction, and internal work motivation, and that met their expectations that work should be meaningful (Hackman and Lee, 1979). Work itself, however, did not change rapidly enough to keep up with these tremendous changes in worker attitudes, aspirations, and values (Mindell and Gorden, 1981). Jobs that offered

little skill variety, challenge, or autonomy, that were boring, repetitive, and seemingly meaningless were therefore causing discontent among workers in many occupations throughout the United States.

The dissatisfaction that employees experienced with the quality of work life was present in the military as well as in private enterprise. Within the military, the concepts of job satisfaction, internal motivation, morale, and esprit were posited as factors which influenced technical and disciplinary behavior and thereby enhanced the combat readiness or effectiveness of a unit. If these factors were not present, the unit became operationally less effective and suffered from higher absenteeism, fewer reenlistments, poor quality products, and misplaced aggression. If, through the proper application of work redesign concepts, these problems could be solved, there would be positive personal as well as organizational outcomes. The military member would have greater internal work motivation, would be more satisfied, and would be more productive, while the unit would become more efficient, adaptable, and combat ready.

Theoretical Framework

The theoretical orientation of the Job Characteristics Model (JCM) of work motivation (Hackman and Oldham, 1980) established the foundation for both the research questions and the job change implementation methods used

in this study. The JCM (Figure 1) identifies five core job characteristics which are hypothesized to be related to specific psychological states which are, in turn, related to personal and work outcomes. The employees' individual differences are accounted for in the model by individual knowledge and skill, growth need strength, and satisfaction with the work context, which moderate the relationships both at the link between the core job dimensions and the psychological states, and between the psychological states and the outcomes.

The theory proposes that positive personal and work outcomes such as high internal work motivation, high general job satisfaction, high "growth" satisfaction, and high work effectiveness are obtained when the three critical psychological states of experienced meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the results of the work activities are present for a given employee. All three of the psychological states must be present for the positive outcomes to be realized (Hackman and Oldham, 1980).

The theory states that these critical psychological states are created by the presence of five core job characteristics. Experienced meaningfulness of the work is enhanced primarily by three of the core dimensions: skill variety, task identity, and task significance. The more of these three job dimensions a specific job has, the more the employee experiences psychological meaningfulness

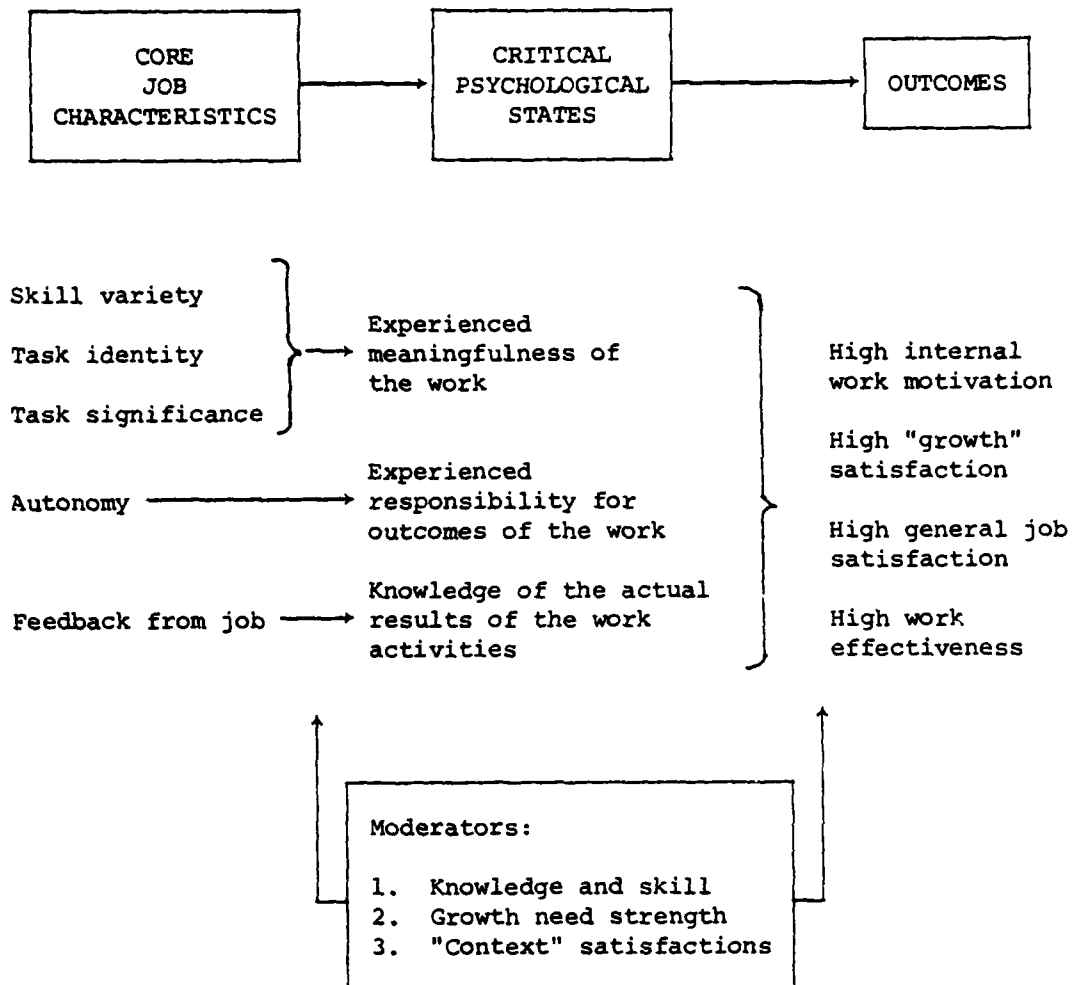


Figure 1. The Job Characteristics Model

Source: J. R. Hackman and G. R. Oldham, Work Redesign (Reading, Massachusetts: Addison-Wesley, 1980), p. 90.

of the job. Experienced responsibility for work outcomes is increased when a job has high autonomy. High autonomy in a job leads the employee to feel that the job outcomes are a result of his efforts, decisions, and activities and therefore his feelings of responsibility for the outcomes, both positive and negative, increase. Knowledge of results is increased when a job is high on feedback. This concept refers to the degree to which work activities enable the employees to obtain "direct and clear" results about their work effectiveness.

Following the model diagrammed in Figure 1, it is possible to generate a summary measure, the Motivating Potential Score (MPS), which reflects the overall motivating potential of a job in terms of the core job dimensions. A job high in motivating potential will not affect all individuals in the same way. Individuals differ in their job knowledge and skill, in their needs for higher order growth, and in their satisfaction with the work context. People who have enough knowledge and skill to perform well, coupled with jobs high in motivating potential, will experience positive feelings as a result of their work activities. Those people who possess insufficient knowledge and skill to perform well, however, will experience unhappiness and frustration at work. People who strongly value and desire personal feelings of accomplishment and growth will respond very positively to a job which is high on the core dimensions. Individuals who do

not value personal growth and accomplishment may find such a job anxiety arousing and may be uncomfortably "stretched" by it (Hackman and Oldham, 1975). The model therefore predicts that individuals for whom higher order growth need strength is important will respond more positively to jobs high on MPS than those with low growth need strength. Finally, the satisfaction level of employees with respect to pay, job security, co-workers, and supervisors may also affect their willingness or ability to take advantage of the opportunities for personal accomplishment provided by enriched work. The individual difference factors of knowledge and skill, growth need strength, and "context" satisfactions, therefore, are used in the model as moderators of the other theory-specified relationships.

Purpose of the Study

The purpose of this research was to accomplish an independent, scientific evaluation of a work redesign project performed in an ongoing complex organization. The primary objective of the experiment was to determine if the application of the Job Characteristics Model (JCM) in a United States Marine Corps detachment would lead to positive personal and organizational work outcomes. The JCM (Figure 1) established the foundation for both the research questions and the implementation methods used. The author posited that those individuals who had their

job enriched (the experimental group) would react more positively to their job than those individuals who did not have their jobs enriched (the control group). Specifically, this experiment attempted to answer the following research questions:

1. Do individuals in the enriched group perceive significantly greater amounts of the core job characteristics (skill variety, task identity, task significance, autonomy, and feedback) than individuals in the control group?
2. Is the average Motivating Potential Score (MPS) greater in the enriched group than in the control group?
3. Do individuals in the enriched group perceive significantly more meaningfulness, responsibility, and knowledge of results of their work than members of the control group?
4. Do individuals in the enriched group have significantly more job satisfaction than individuals in the control group?
5. Do individuals in the enriched group report significantly more internal work motivation than individuals in the control group?
6. Are individuals in the enriched group rated significantly better in work performance and conduct than individuals in the control group?
7. Do individuals in the enriched job have significantly fewer occasions of absenteeism than

individuals in the control group?

8. Do individuals in the enriched group who have a high Growth Need Strength (GNS) report significantly more experienced meaningfulness, experienced responsibility, knowledge of results, general job satisfaction, internal work motivation, and supervisory satisfaction than individuals with low GNS?

Importance of the Study

The Job Characteristics Model (JCM) rapidly became the dominant paradigm in organizational psychology's search for the program that would turn alienated unproductive workers into happy, self-actualizing, productive workers. This research was a well designed experimental field test of the JCM in a highly structured, rigidly hierarchical military setting, which relied heavily on immediate obedience and strict discipline. This research was a longitudinal field experiment in a complex organization that used a control group, proper measures, reasonable time intervals, and statistical measures of significance to test the variables associated with the JCM. This experiment did not put the burden on management to identify the problematic aspects of work, but instead encouraged worker participation in identifying problems in the organization's specific jobs. Workers were also encouraged to make job change suggestions based on their understanding of the Job Characteristics Model and

its concept of the redesign of core job characteristics leading to positive personal and organizational outcomes. Finally, this research adds to the growing understanding of how individual differences (Growth Need Strength) affect how employees react to enriched work.

Scope of the Study

This study entailed an extensive review of the available literature on work redesign, job enrichment, and the moderating effect of individual differences on these concepts. The theoretical orientation for work redesign projects was explored and critiqued, and the instrument used to measure the variables of the Job Characteristics Model--the Job Diagnostic Survey (JDS)--was discussed at length. The research focused on a group of marines who composed a Marine Detachment at a United States Naval Air Station on the west coast. The number of individuals who made up the experimental group was small (39), so it was difficult to generalize about the results of this study.

The study was limited to the evaluation of a single work redesign project and did not explore the various methods of how to best implement work redesign projects in organizations. Neither did this study attempt to build or reformulate theory regarding work redesign; it was limited to the test of the validity of the theoretical framework of the experiment, the Job Characteristics

Model of work redesign. Finally, since the experiment lasted six months, the conclusions must pertain to that length of time. The long term effects of work redesign in the experimental organization can only be speculated.

Definition of Terms

The following terms are defined for the purpose of the reported research:

Quality of Work Life: More than simply job satisfaction, this term includes also opportunities for growth and self-development, freedom from tension and stress, and satisfaction of basic needs (Lawler, 1975).

Task: Those activities that make up a specific job or piece of work of an employee or group of employees.

Work or Job: An activity or group of related activities that are performed as a part of a larger organizational system of activities by an employee for remuneration (Rosenbach, 1977).

Work Redesign or Job Enrichment: A planned and purposeful change to the work that is primarily concerned with job content to provide the worker with increasing opportunities for responsibility, personal achievement, feedback, growth, advancement, and meaningful work experience.

Job Rotation: A planned rotation by workers from task to task without any major disruption in the work flow.

Job Enlargement: A planned and purposeful change

involving increasing the number and variety of skills and activities performed by the individual worker on the same organizational level so as to increase the horizontal scope of the job.

Job Satisfaction: An overall measure of the degree to which an employee is happy in his or her work.

Internal Work Motivation: The degree to which the employee is self-motivated to perform effectively on the job.

Overview of the Dissertation

The first chapter of this dissertation discusses the topics of job satisfaction, work motivation, and the quality of work life. It introduces the concept of work redesign or job enrichment as a strategy of change that may lead to improvements along these dimensions. Chapter 1 also identifies and discusses the purpose, scope, and importance of the study, defines terms, and places the study within a theoretical framework.

Chapter 2 presents a brief history of work design and discusses theoretical models which address individual work motivation and work redesign. The theories discussed include: Maslow's hierarchy of needs theory, activation theory, expectancy theory, equity theory, Alderfer's ERG theory, Herzberg's motivation-hygiene or two-factor theory, Hackman and Oldham's job characteristics theory, and Kiggundu's extension of job characteristics theory.

Chapter 3 reviews the literature and discusses research concerning work redesign and the Job Characteristics Model.

Chapter 4 describes the methodological procedures followed in performing the research, identifies the experimental design, and presents the research hypotheses. This chapter also discusses the research environment, subject selection, instrumentation, methodological assumptions and limitations, data collection procedures, and the methods of data analyses.

Chapter 5 is a report of the findings of the research. Chapter 6 presents a summary of the research, discusses the results, and presents some conclusions based upon those results. The chapter concludes with implications for theory and practice and recommendations for future research.

Chapter 2

THEORETICAL ORIENTATIONS: A REVIEW

Managers in all types of organizations are continually faced with the fact that vast differences exist in the performance of a group of employees. Some employees always perform at high levels, need little or no direction, and appear to enjoy what they are doing. Other employees, however, perform only at marginal levels, require constant attention, and are often absent from their work stations. The reasons for these differences in performance are varied and complex. However, the core concept associated with each of the differences is motivation. Because assumptions regarding the stimulation of intrinsic motivation form the basis for the relationship between enriched work redesign and positive work outcomes, this chapter focuses on the theoretical foundations of internal work motivation and work redesign. The chapter presents a brief history of work design followed by discussions of contemporary theories of motivation. Maslow's (1943, 1954) need hierarchy theory, Alderfer's (1972) ERG theory, and Herzberg's (Herzberg, Mausner, and Snyderman, 1959; Herzberg, 1966; Herzberg, 1976) motivation-hygiene theory are presented first, followed by a discussion of activation

theory, expectancy theory, and equity theory. Finally, Hackman and Oldham's (1975, 1976, 1980) Job Characteristics Model of individual work motivation, the model for this research, is discussed in detail, as is Kiggundu's (1980, 1981) extension of that model to include task interdependence.

History of Work Design

The historical development of work design progressed through three stages: (1) the degree of job specialization, (2) management's response to worker reactions, and (3) the contemporary approaches (Ivancevich, Szilagyi, and Wallace, 1977). During stage one, the period of industrialization, the emphasis of work design was on the increasing specialization of jobs. The "scientific management" approach initiated by the work of Frederick W. Taylor (1911) suggested that through scientific methods jobs could be designed and people trained to attain maximum output. In its basic format, it assumed that jobs should be simplified, standardized, and specialized for each component of the required work. Taylor's followers concentrated on two main aspects of Taylor's ideas: determining the one best way to do a job and ensuring compliance with the prescribed work methods. The emphasis on the one "best way" led to what was referred to as time and motion studies (Scott, Mitchell, and Birnbaum, 1981). The underlying idea was clear: the workers and their jobs were to

be treated like cogs in a machine. The movement toward greater job specialization, while providing benefits to the planning and scheduling of the work, also created many jobs that were routine and boring, leading to many situations of worker dissatisfaction, turnover, and absenteeism.

During stage two, there was a growing awareness by managers and behavioral scientists of worker reactions to their jobs. The high level of job specialization promoted by the scientific management approach created a number of problems centering on the individual worker's morale and behavior. These problems were partially attributed to the boredom and monotony created by the highly specialized, routine nature of the individual employee's work. The early response by management to this situation were the techniques of "job rotation" and "job enlargement" (Ivancevich, Szilagyi, and Wallace, 1977). The premise of job rotation was that the various tasks performed by workers were interchangeable, and workers could be rotated from task to task without any major disruption in the work flow. With this approach, there was really no major change in the actual jobs of the workers. Management hoped, however, that by rotating employees between different jobs the boredom and routineness could be minimized by providing workers with the opportunity to develop other skills and also a larger perspective of the total production process. Nevertheless, neither the jobs nor the

expectations of the workers were significantly altered. Critics pointed out that with job rotation "individual workers have merely been exposed to a different series of monotonous and boring jobs" (Ivancevich, Szilagyi, and Wallace, 1977:148). Job enlargement represented the first attempt by managers to actually redesign jobs. The basic feature of this technique was the horizontal expansion of jobs to increase the number and variety of skills and activities performed by the individual worker. By increasing the variety of skills required and expanding the number of operations, it was anticipated that the monotony and boredom would be reduced, resulting in a higher level of job satisfaction. Critics of job enlargement contended the essential nature of jobs remained unchanged in that jobs were still boring and dissatisfying. Job enlargement only give workers more to do.

Ivancevich, Szilagyi, and Wallace (1977) argued that besides the problems caused by the essentially unchanged nature of the work, neither job rotation nor job enlargement was guided by any systematic conceptual or theoretical framework. Stage three involves the contemporary approaches to work redesign, approaches that are solidly based on a well formulated theoretical framework. The purpose of this chapter is to examine these theoretical foundations of work redesign and to present a model of individual work motivation which provides a solid

theoretical foundation for the research reported in subsequent chapters. Because this study focuses on individual work redesign, the discussion is limited to those theoretical models which address individual work motivation.

Content Theories

Content theories of individual motivation focus on the question of what it is that energizes, arouses, or starts behavior (Ivancevich, Szilagyi, and Wallace, 1977). The answers to this question are provided by motivational theorists in their discussion of the concepts of needs or motives that drive people and the incentives that cause them to behave in a particular manner. A need or motive is considered to be an internal quality to the individual. Hunger (the need for food), or a steady job (the need for security), are seen as motives that arouse people and cause them to choose a specific behavioral act or pattern of acts. Incentives, on the other hand, are viewed as external aspects associated with the goal or end result the person hopes to achieve through his or her actions. The income earned from a steady day of work is valued by the person. It is this value or attractiveness that is defined as incentive. The three most publicized and researched content theories of motivation are Maslow's (1943, 1954) need hierarchy, Alderfer's (1972) ERG theory, and Herzberg's (Herzberg, Mausner, and Snyderman, 1959; Herzberg, 1966,

1976) two-factor theory. These theories have received considerable attention in both research studies and managerial application.

Hierarchy of Needs

Maslow's (1943, 1954) need hierarchy theory postulated that people in the workplace were motivated to perform by a desire to satisfy a set of internal needs. His theoretical framework was based on three fundamental assumptions (Maslow, 1954):

1. People's needs can influence their behavior. Only unsatisfied needs can influence behavior; satisfied needs do not act as motivators.
2. A person's needs are arranged in an order of importance, or hierarchy, from the basic to the complex.
3. The person advances to the next level of the hierarchy, or from basic to complex needs, only when the lower need is at least minimally satisfied.

Maslow (1954) proposed five classifications of needs which represented the order of importance to the individual. These needs were identified as: (1) physiological, (2) safety (security), (3) social (affiliation), (4) esteem (recognition), and (5) self-actualization. A general representation of this hierarchy is shown in Figure 2.

Physiological needs are viewed as the primary needs of individuals, such as the need for food, drink,

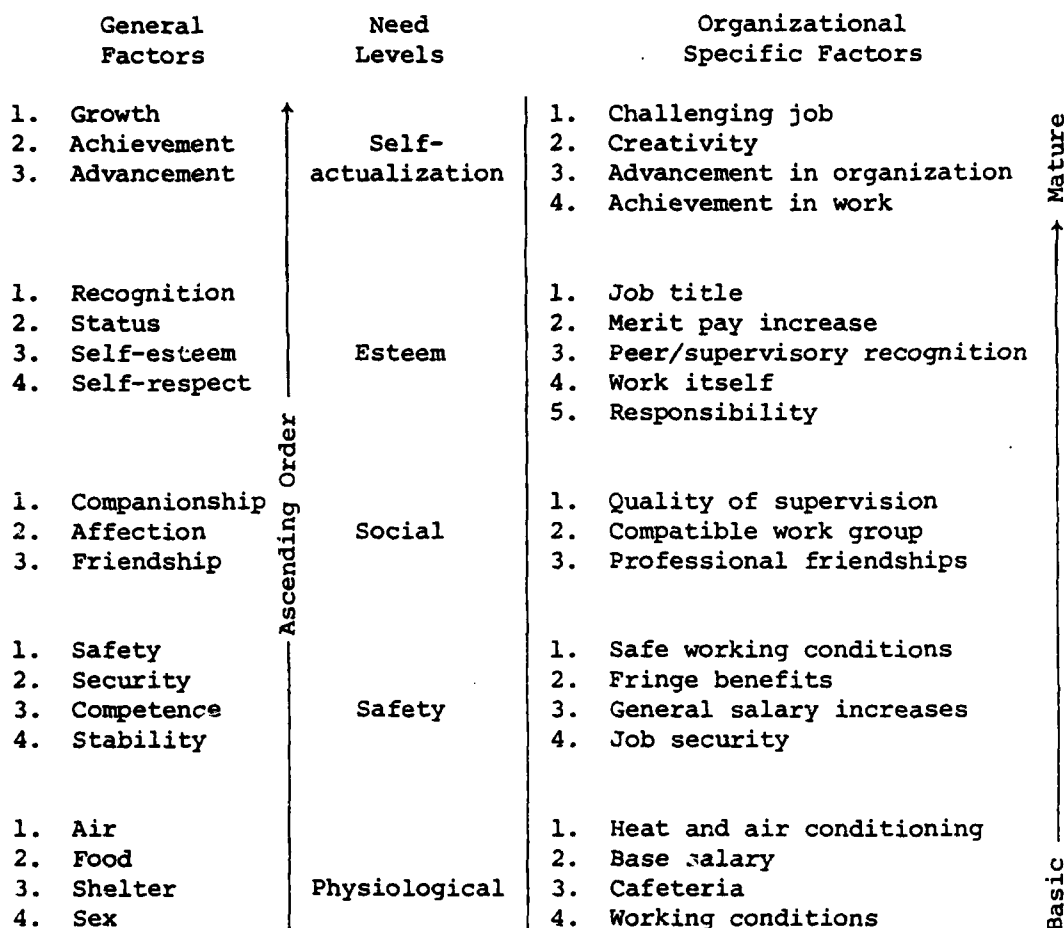


Figure 2. Maslow's Need Hierarchy

Source: J. M. Ivancevich, A. D. Szilagyi, and M. J. Wallace, Organizational Behavior and Performance (Santa Monica, California: Goodyear Publishing Company, 1977), p. 105.

shelter, and the relief from or avoidance of pain. In the workplace, such needs are represented by concern for salary and basic working conditions (heat, air conditioning, and eating facilities).

When the primary, or physiological, needs are minimally satisfied, the next higher level of needs, the safety and security needs, assume importance as motivators. These are reflected in the need for freedom from threat, protection against danger and accidents, and the security of the surroundings. In the workplace, individuals view these needs in terms of such aspects as safe working conditions, salary increases, job security, and an acceptable level of fringe benefits to provide for health, protection, and retirement needs.

When physiological and safety needs are minimally satisfied, social needs become dominant. These needs concern such aspects as the need for friendship, affiliation, and satisfying interactions with other people. In organizations, such needs are operationalized by a concern for interacting with fellow workers, employee-centered supervision, and an acceptance by others.

Esteem needs, the next level, focus on the need for self-respect, respect from others for one's accomplishments, and a need to develop a feeling of self-confidence and prestige. The successful accomplishment of a particular task, recognition by others of a person's skills and abilities to do effective work, and the use of

organizational titles are examples from the workplace.

Self-actualization, the need to fulfill oneself by maximizing the use of abilities, skills, and potential is the highest level of the need hierarchy. People with dominant self-actualization needs are characterized as individuals who seek work assignments that challenge their skills and abilities, permit them to develop and to use creative or innovative approaches, and provide for general advancement and personal growth.

Maslow's (1943, 1954) theory was built on the framework that unsatisfied needs served as factors that aroused people to behavior and stated that people were motivated to satisfy needs in a five-level hierarchical order ranging from basic physiological needs to self-actualization needs. When a need is minimally fulfilled, it then ceases to be a motivator of behavior. Research findings, however, raised criticisms about the theory and the viability of the five need levels. Lawler and Suttle (1972) reported that selected data from managers in two different companies provided little support that a hierarchy of needs existed. The study identified two, not five, levels of needs: a biological level and a global need level encompassing the higher order needs (Lawler and Suttle, 1972). Ivancevich, Szilagyi, and Wallace (1977) emphasized that individual needs should be viewed not in a static, but in a dynamic context. These needs are constantly changing due to the various situations in

which people become involved. A manager, for example, trying to satisfy esteem needs through his or her work may become concerned with job security needs when adverse economic conditions result in worker layoffs and terminations. Also, more than one level of need may be operational at the same time for an individual (Ivancevich, Szilagyi, and Wallace, 1977). A project engineer may strive to satisfy a self-actualization need while simultaneously being concerned with safety needs. Finally, the theory states that a satisfied need is not a motivator. Although in a general sense this may be true, it is also true that individual needs are never fully or permanently satisfied as a result of a single act or actions. Locke (1976) observed that it was the nature of needs that they must be continually and repeatedly fulfilled if the individual was to perform adequately. If a number of needs are operating at the same time, they would seem to contradict the idea of need satisfaction occurring in a fixed hierarchical order.

ERG Theory

Alderfer's (1972) ERG theory is a more recently proposed motivation approach that seeks to establish human needs in organizational settings. Alderfer condensed the Maslow hierarchy into three need categories: existence (E), relatedness (R), and growth (G).

Existence needs are all the various forms of

physiological and material desires, such as hunger, thirst, and shelter. In organizational settings, the need for pay, benefits, and physical working conditions are also included in this category. This category is comparable to Maslow's (1954) physiological and certain safety needs.

Relatedness needs include all those that involve interpersonal relationships with others in the workplace. This type of need in individuals depends on the process of sharing and mutuality of feelings between others to attain satisfaction. This need category is similar to Maslow's (1954) safety, social, and certain esteem needs.

Growth needs are all those needs that involve a person's efforts toward creative or personal growth on the job. Satisfaction of growth needs results from an individual engaging in tasks that not only require the person's full use of his or her capabilities, but also perhaps require the development of new capabilities. Maslow's (1954) self-actualization and certain of his esteem needs are comparable to these growth needs.

ERG theory is based upon three major propositions:

- (1) The less each level of need is satisfied, the more it will be desired (Need Satisfaction). For example, the less existence needs such as pay, benefits, and physical working conditions are satisfied, the more they will be desired.
- (2) The more lower level needs are satisfied, the greater will be the desire for higher level needs (Desire Strength). For example, the more existence needs are satisfied for the

worker, the greater the desire will be for relatedness needs. (3) The less the higher level needs are satisfied, the more the lower level needs will be desired (Need Frustration). For example, the less growth needs are satisfied, the more relatedness needs will be desired. These relationships are shown in Figure 3.

Two important differences between ERG theory and Maslow's need hierarchy should be pointed out. First, the need hierarchy theory is based upon a satisfaction-progression approach. In other words, an individual will progress to a higher order need once a lower order need is satisfied. ERG theory, on the other hand, incorporates not only a satisfaction-progression approach, but also a frustration-regression component. Frustration-regression describes the situation where a higher order need remains unsatisfied or frustrated, and greater importance or desire is placed on the next lower need. As shown in Figure 3, for example, frustration of growth results in greater desire for relatedness needs. The second major difference is closely related to the first. Unlike the need hierarchy approach, ERG theory indicates that more than one need may be operative at any one time.

Motivation-Hygiene Theory

Herzberg's two-factor or motivation-hygiene theory (Herzberg, Mausner, and Snyderman, 1959; Herzberg, 1966, 1976) is closely related to Maslow's (1943, 1954) need

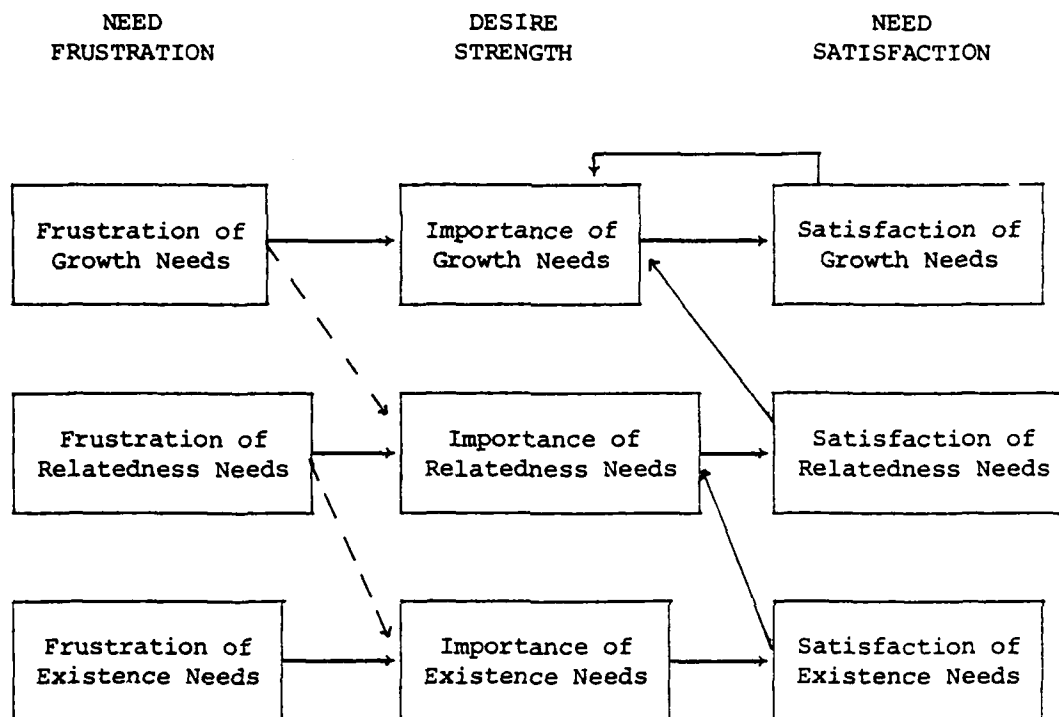


Figure 3. Satisfaction-Progression, Frustration-Regression Components of ERG Theory

Source: J. M. Ivancevich, A. D. Szilagyi, and M. J. Wallace, Organizational Behavior and Performance (Santa Monica, California: Goodyear Publishing Company, 1977), p. 111.

hierarchy, and is probably the most influential theoretical stimulus to work redesign as a technique for increasing employee performance and satisfaction through enhanced motivation. Herzberg, Mausner, and Snyderman (1959) used structured in-depth interviews of approximately 200 engineers and accountants to identify those specific incidents or events in the past that were associated with high dissatisfaction. Upon analysis of the content of these critical incidents, they concluded that the favorable critical incidents were associated with feelings of satisfaction and that qualitatively different unfavorable critical incidents were associated with dissatisfaction. Herzberg, Mausner, and Snyderman (1959) stated that job satisfaction factors did not represent continuous variables ranging from positive to negative (satisfaction to dissatisfaction), but rather satisfaction and dissatisfaction existed on two separate and distinct continua. According to this two-factor theory, when people feel dissatisfied with their jobs, they are concerned about the environment in which they are working. On the other hand, when people feel satisfied with their jobs, this has to do with the work itself. The hygiene or dissatisfaction factors are associated with the individual's relationship to the environment of work and include such factors as company policy and administration, supervision, working conditions, interpersonal relations, salary, status, and job security. These are extrinsic factors. When they are present in

sufficiency, the worker is not dissatisfied; when they are lacking, the worker is dissatisfied. The motivation or satisfaction factors are associated with the work itself and include achievement, recognition, responsibility, advancement, and growth. These are, therefore, intrinsic factors.

It was Herzberg's (1976) belief that job satisfaction was a function of both satisfiers and dissatisfiers. Satisfaction will be high if positive aspects of both hygiene and motivation factors are present at a proper level. Therefore, the positive aspects of the hygiene factors are necessary but not sufficient conditions for job satisfaction. This theory requires that a job will enhance work motivation and satisfaction only to the degree that motivation factors are built into the work itself (Herzberg, 1976). It provides a clear and straightforward way of thinking about employee motivation and for predicting the likely impact of various contemplated changes on motivation.

Herzberg's two-factor theory received a great deal of attention from behavioral scientists. Some researchers were unable to provide empirical support for the theory and cited evidence critical of the theory as well as the methodology (Ewen et al., 1966; Friedlander, 1964; Vroom, 1964, Dunnette, Campbell, and Hakel, 1967; House and Wigdor, 1967; Hinton, 1968; King, 1970; Schneider and Locke, 1971; Steers and Mowday, 1977; Waters and Roach, 1971). The

literature also yields research that supports the Herzberg theory (Herzberg, 1966, 1976; Whitsett and Winslow, 1967; Winslow and Whitsett, 1968; Grigaliunas and Herzberg, 1971; Grigaliunas and Wiener, 1974). The research variously demonstrated that: (1) a given factor (such as pay) caused satisfaction in one sample and dissatisfaction in another; (2) satisfaction or dissatisfaction of a factor was sometimes a function of the age and organization level of the worker; and (3) individuals sometimes confused company policies and supervisory style with their own ability to perform as factors causing satisfaction or dissatisfaction.

Two extensive reviews of the literature on the two-factor theory published at the same time (House and Wigdor, 1967; Whitsett and Winslow, 1967) summarized the significant literature from 1959 to 1967, but each review supported a different conclusion. House and Wigdor (1967) criticized the two-factor theory on three points: (1) it was methodologically bound; (2) it was based on faulty research; and (3) it was inconsistent with past evidence concerning satisfaction and motivation. The major criticism concerned the methodology used to develop the theory. The critical incident method, which required people to look at themselves retrospectively, did not adequately provide a vehicle for the expression of other factors to be mentioned. With such a methodology, there was a tendency for the most recent events of a person's work experience to be identified.

This tended to ignore or diminish the impact of past and possibly equally important events. Generally, most researchers agreed that the two-factor theory was supported when Herzberg's (1966, 1976) critical incident method of research was used; but when other methodologies were used the theory was not supported. A second methodological criticism concerned the nature of the original samples used by Herzberg. Critics questioned whether it was justified to generalize to other occupational groups from such a limited sample (accountants and engineers in Pittsburgh). The technology and environments of the two study groups might vary considerably from such groups as nurses, sales representatives, or secretaries in other areas of the country. Waters and Roach (1971), for example, conducted a comprehensive study using female and male subjects from a national insurance company and found their study offered no support for the two-factor study.

Additional criticisms focused on the manner in which the two-factor theory perhaps oversimplified the nature of job satisfaction. Satisfaction or dissatisfaction could reside in the content and context of the job jointly. Pallone, Hurley, and Rickard (1971) reviewed 24 studies pertinent to the two-factor theory and found only five studies which supported the Herzberg findings. The rest generally concluded that job context (extrinsic) variables and job content (intrinsic) variables were related to both job satisfaction and job dissatisfaction. Moreover,

Wernimont (1966), who, like Herzberg, studied engineers and accountants, concluded that intrinsic and extrinsic factors could both be sources of job satisfaction, but intrinsic factors were significantly stronger.

Whether job satisfaction factors represent continuous variables ranging from positive to negative (satisfaction to dissatisfaction) or whether satisfaction and dissatisfaction exist on two separate and distinct continua as the two-factor theory postulates remains controversial, at best. Although the list of criticisms continues to expand, the value of the theory should not be underestimated. Hackman and Lee (1979) emphasized that what the Herzberg theory did, and did well, was to focus attention directly on the enormous significance of the work itself as a factor in the motivation and satisfaction of employees.

Process Theories

The content theories of motivation provide managers with a better understanding of the particular work-related factors that arouse employees to motivated behavior. These theories, however, provide little understanding of why people choose a particular behavioral pattern to accomplish work goals. This choice aspect is the concern of the process theories approach to motivation in organizations.

Activation Theory

Activation theory assesses the dysfunctional affective and behavioral effects of highly repetitive jobs, and offers an explanation of work behavior of individuals in organizations where specialization and work simplification result in reduced performance and dissatisfaction. According to Scott (1966), activation theory anticipates a number of behavioral outcomes in tasks requiring constant repetition of a limited number of responses. As an individual becomes familiar with a repetitive task and its surroundings and learns the required responses, a decline in activation level is expected. Based on the idea that people require stimulation, activation theory suggests that if such stimulation is too low, people seek to increase their activation level. In a repetitive job environment this often occurs outside of the task in such behaviors as daydreaming, horseplay, socializing with other employees, and sabotage (Scott, 1973).

According to Scott (1973), introduction of stimulating factors extrinsic to the task, such as money, fringe benefits, pleasant working conditions and surroundings, or rest periods, perhaps improve performance by raising the activation level, but only temporarily, if at all. Increasing variety within the job itself, as with work redesign or job enrichment, has greater potential for long-term increases in positive work outcomes. Activation

theory suggests that variety and complexity introduced into a simple, repetitive task reduces habituation and sustains activation at a level required for desired behavior at the work place. Thus, work redesign has more potential for affecting sustained productivity and satisfaction than the introduction of extrinsic factors.

Activation theory provides a conceptual framework that integrates a number of empirical observations of task behavior and anticipates them in a general way. However, it fails to provide a means by which one can determine the conditions under which work redesign may be beneficial and precisely how to go about redesigning a job (Porter, Lawler, and Hackman, 1975). Thus, its testability is limited and so is its use as a pragmatic guide to redesigning jobs.

Expectancy Theory

Expectancy theory is another theoretical approach to understanding the effects of internal work motivation and work redesign. Georgopoulos, Mahoney, and Jones (1957) tested components of expectancy theory, but never formulated a complete model. Vroom (1964) is commonly recognized as the father of expectancy theory in the workplace since he was the first to formulate a complete model. Although there are several modifications to Vroom's work (Lawler and Porter, 1967; Galbraith and Cummings, 1967; Graen, 1969; Campbell et al., 1970), Vroom's (1964) model is still the core of expectancy theory.

In its basic form, expectancy theory relates to choice behavior. The major premise of the theory is that the expenditure of energy is a joint function of individuals' subjective expectancy that their behavior will lead to particular outcomes and the value they place on those outcomes. The theory states that individuals will evaluate various strategies of behavior and then choose the particular strategy that they believe will lead to those work related rewards that they value. According to expectancy theory, an employee's motivation to perform effectively is determined by two variables. The first variable is the individual's subjective probability that expending a given amount of effort toward effective performance will result in his or her realizing a given reward or a positively valued outcome. This effort-reward probability is determined by two subjective probabilities: expectancy, which is the probability that effort will result in performance; and instrumentality, which is the probability that performance will result in reward. The second variable that must be considered is the reward value, a concept which Vroom (1964) referred to as valence. Valence is the strength of an employee's preference for a particular outcome, or the individual's perception of the value of the reward or outcome that might be obtained by performing effectively. Vroom (1964:15) defined valence as "affective orientations toward particular outcomes." Valence is attached to the anticipated rather than the actual

satisfaction to be gained from an outcome, and it may be negative, neutral, or positive. In Vroom's (1964) expectancy equation, it may take a value between -1 and +1. The effort-reward probability is given a value between 0 and 1. The "force" or motivation to perform an act is thus a function of both valence and the effort-reward probability (expectancy and instrumentality). Vroom (1964) expressed this relationship in the following manner:

$$F = E \times V$$

where F = force to perform an act

E = the expectancy that the act will be
followed by a particular outcome, and

V = the valence of the outcome

Since in most situations a number of outcomes result from a particular act, the equation must be summed across all of them, and the complete equation is therefore:

$$F = \sum (E \times V)$$

Force or motivation, then, is determined by multiplying the effort-reward probabilities by the valence for a number of different outcomes. The effort-reward probabilities and valence are hypothesized to combine multiplicatively because when either is zero, force or motivation will also be zero, and this is in agreement with common sense. If a person perceives a very high probability that a particular act will lead to a particular outcome, but places no value on that outcome, there will be

no motivation to perform the act. Conversely, if a person places a high value on a particular outcome, but perceives no probability of obtaining it, motivation will again be zero. Only when both terms are positive will motivation be positive. Effort-reward probability and valence combined additively would produce unrealistic results.

Following Vroom's (1964) formulation, expectancy theory was subjected to significant modifications and development, and numerous empirical tests of its validity were conducted. Tests of the theory tended to become increasingly complex due to the large number of variables which were included in attempts to improve its predictive power. In both the development and testing of expectancy theory, the contribution of one researcher, Edward E. Lawler, was particularly significant. Lawler is also responsible for pursuing the implications of expectancy theory in the field of work redesign, and it is this aspect of his work that is examined here.

Lawler (1969) extended expectancy theory by distinguishing between extrinsic rewards such as pay and promotion and intrinsic rewards such as achievement and personal development. Extrinsic rewards are part of the job situation and refer to outcomes that come to individuals from others because of their job performance; intrinsic rewards are associated with the job itself and are internally mediated since the individual rewards himself. This idea provided the basis for Lawler's

later research (Hackman and Lawler, 1971) into work redesign. According to Lawler (1969), the content of the job itself is the critical determinant of whether good performance on the job leads to feelings of accomplishment, growth, and self-esteem. He identified three characteristics which jobs must possess if they are to lead the people who perform them to expect that good performance will lead to intrinsic rewards: (1) the individual must receive meaningful feedback about his performance; (2) the job must be perceived by the individual as requiring him to use abilities that he values; and (3) the individual must feel he has a high degree of self-control over setting his own goals and defining the paths to those goals (Lawler, 1969).

Lawler pointed out that work redesign had a positive effect on motivation because job changes influenced an individual's belief about the probability that rewards resulted from the expenditure of higher levels of effort. This was possible because the changes influenced the probability that rewards were seen to result from good performance not because they influenced the perceived probability that effort resulted in good performance. Stated another way, work redesign was more likely to affect the instrumentality of good performance than the expectancy that effort led to performance (Rosenbach, 1977).

Expectancy theory created a great deal of research and therefore contributed significantly to our knowledge of

work motivation. There are, however, some serious problems in using it as a theoretical foundation for work redesign. First was the problem noted by Lawler and Suttle (1973) that expectancy theory became so complex that it exceeded the measures which existed to test it. The variables in expectancy theory are typically measured using survey questionnaires, which are usually different from researcher to researcher and are not always scientifically validated (Schmidt, 1973). Comparisons from study to study are thus questionable. The second problem, closely related to the first, is that the complexity of the model makes it very difficult to test fully. Few studies have been reported that tested all the variables within the expectancy theory framework. The primary problem according to Heneman and Schwab (1972), and Wahba and House (1974), is that the predictive validity of the theory is essentially unknown. Effort-to-performance expectancies, performance-to-reward expectancies, and valences apparently are valid components that relate to an individual's motivation and subsequent performance. Whether these component variables act independently to predict motivation, or are combined in some mathematical form, is a subject for future research efforts. The greatest contribution of expectancy theory to work redesign research is its incorporation into Hackman and Lawler's (1971) expanded theory of employee reactions to job characteristics and Hackman and Oldham's (1975, 1976, 1980) Job Characteristics Model.

Equity Theory

Another process approach to understanding motivation is equity theory. The theory is conceptually a hybrid of two other related theories, distributive justice (Homans, 1961) and cognitive dissonance (Festinger, 1957). Adams (1963) is credited with the initial development and testing of the theory, which is concerned with an individual's motivation to expend energy at work. Equity theory contends that if individuals perceive a discrepancy between the amount of rewards they receive and their efforts, they are motivated to reduce the discrepancy; furthermore, the greater the discrepancy, the more the individuals are motivated to reduce it. Discrepancy, which may be based on subjective perception or objective reality, refers to the perceived difference that may exist between two or more individuals. Adams (1963) defined a discrepancy, or inequity, as a person's perception that the ratio of his or her job outcomes to job inputs in comparison with a reference person's outcomes to inputs, were unequal. The reference person may be someone in an individual's group, in another group, or outside the organization.

In equity theory, inputs are such aspects as effort, skills, education, and task performance that an individual employee brings to or puts into the job. Outcomes are those rewards that result from task accomplishment: pay, promotion, recognition, achievement, and status. The factor that determines the equity of a particular

input-outcome balance is the individual's perception of what he or she is giving and receiving as compared to what another, or others, are giving and receiving. Adams (1963) postulated that individual employees compared inputs and outcomes with other workers of roughly equal status. If the two ratios were not in balance, the individual was motivated to reduce the inequity. Adams (1963) identified this as a three-step process: (1) comparison of outcome/input ratios between the focal person and reference person; (2) decision (equity = satisfaction, inequity = dissatisfaction); and (3) motivated behavior to reduce inequity. The strength of this motivation varied directly with the perceived magnitude of imbalance between inputs and outcomes.

There are a number of behavioral patterns that an individual can follow to reduce an inequitable situation: the person may withdraw from the field; the person may perceptually distort either inputs or outcomes; the person may change the object of his comparison, that is, compare himself to a new reference person; or the person may manipulate his productivity and work quality in such a way that he reduces feelings in inequity.

The majority of the research efforts on equity theory focused on wages or pay levels as the basic outcome and effort or performance level as the primary input factor (Andrews, 1967; Goodman and Freedman, 1971). The major problem with this theory, despite the recognition that

outcomes included promotion, recognition, achievement, and status, as well as pay, was that research of the theory focused only on the outcomes of pay. The general thrust of the contemporary theories of worker motivation emphasized that pay was neither the most important nor the only factor that motivated individuals.

Development of the Job Characteristics Model

The Turner and Lawrence Study

Turner and Lawrence (1965) conducted research on the relationship between objective characteristics of jobs and employee satisfaction and attendance. They published a thorough and detailed study of the attitudinal and behavioral responses of workers to characteristics of their jobs based on a sample of 470 workers from 11 industries working on 47 different jobs (Turner and Lawrence, 1965). They defined and developed measures for six "requisite task attributes" which they hypothesized to be positively related to worker satisfaction. Turner and Lawrence (1965) identified the six attributes as:

- (1) the amount of variety in the work, (2) the level of autonomy allowed the employee performing the work, (3) the amount of interaction required in carrying out task activities, (4) the opportunities for optional interaction, (5) the level of knowledge and skill required, and (6) the amount of responsibility given to the employee.

They developed an instrument measuring employees' perceptions of their jobs on each of these six attributes, and they formulated a weighted measure, the Requisite Task Attributes Index (RTA Index), which served as a summary measure of the attributes. The RTA Index was used to examine the relationship between the attributes of jobs and worker satisfaction and attendance at work.

Turner and Lawrence (1965) hypothesized that employees working on jobs that were high on the RTA Index would have higher job satisfaction and less absenteeism than employees working on jobs low on the RTA Index. Their hypothesis was only partially supported. The predicted relationship between the RTA Index and worker response was supported only for workers from factories located in small towns. Turner and Lawrence (1965) concluded that the workers in the sample were drawn from two distinct and separate populations whose members responded differently to similar job attributes. They found that workers from factories located in urban areas responded very differently from workers in factories in small towns. Rather than ignoring the effects of individual differences, or attributing them to chance, Turner and Lawrence attributed the unexpected differences in worker reactions to jobs high on the RTA Index to the differences in the cultural backgrounds of the workers.

Turner and Lawrence's (1965) specific classification of attributes and their attention to the consideration of

individual and situational differences in work outcomes were significant contributions to work redesign theory. They carefully and explicitly developed operational measures of basic job dimensions and provided insight on the importance of cultural and sociological factors in determining worker responses to the characteristics of their jobs. Their research provided a conceptual framework from which subsequent research could refine the moderating effects of individual differences in the relationship between job characteristics and workers' affective responses to their work.

The Hackman-Lawler Theory

Whereas Turner and Lawrence (1965) dealt with individual differences on a subcultural or sociological level, Hackman and Lawler (1971) chose to conceptualize and measure the relevant individual differences directly at the individual level of analysis. Hackman and Lawler (1971) developed a conceptual framework based on the expectancy theory of motivation. Within the expectancy framework, task characteristics were seen to influence motivation, both through the intrinsic valence attached to work behavior and task accomplishment, and according to the perceived probability that personal effort would lead to such accomplishments. Individuals' value systems, perceptions, and experiences were seen as moderating the influence of task characteristics.

Hackman and Lawler (1971) proposed that, while employees would be motivated to perform work to the extent that they believed they could obtain valued outcomes, such valence depended on satisfaction of physiological and psychological needs of the individual. Referring to Maslow (1943, 1954) and Alderfer (1972), Hackman and Lawler (1971) posited that in contemporary Western society most employees' lower level needs were reasonably well satisfied, while the higher order needs were not. They hypothesized that these higher order needs would be satisfied in individuals "capable of higher order need satisfaction" when the individuals learned that, as a result of their own efforts, they accomplished something that they personally believed was worthwhile and meaningful. More specifically, individuals who desired higher order need satisfactions were most likely to obtain them when they worked effectively on jobs which provided feedback on the adequacy of their personal work activities. Hackman and Lawler (1971) summarized their theoretical concept of work design by stating that in order to establish conditions for favorable affective responses of employees to their jobs: (1) the job must allow a worker to feel personally responsible for a significant portion of the work; (2) the job outcomes must be intrinsically meaningful or otherwise experienced as worthwhile to the employee; and (3) the employees must be aware of the results of their work and their performance effectiveness. Drawing on the work of

Turner and Lawrence (1965), Hackman and Lawler (1971) specified four requisite task attributes as being useful measures of these three general job characteristics. These were identified as the core job dimensions and were:

- (1) skill variety, (2) autonomy, (3) task identity, and
- (4) feedback.

In summary, Hackman and Lawler (1971) proposed that characteristics of jobs could establish conditions which would enhance the intrinsic motivation of workers who desired higher order need satisfaction. Such individuals would be able to obtain personal satisfaction when they performed well on jobs which they experienced as high on the four core job dimensions. The better an individual performed on a job which was perceived as high on the core dimensions, the more satisfied he was likely to be.

The Hackman and Lawler (1971) study made a great contribution to work redesign theory by building a theoretical foundation for the relationship between job characteristics and attitudinal and behavioral work outcomes. Their identification of growth need strength as a moderating variable between job characteristics and worker responses brought the analysis of individual differences to the individual worker level (Rosenbach, 1977). Hackman and Lawler were successful in changing the direction of work redesign research and in developing the groundwork for important advancements in theoretical development.

Job Characteristics:
A Theory and Model

This approach specifies the objective characteristics of jobs that create conditions for internal work motivation. Based on earlier research by Turner and Lawrence (1965) and building on the conceptual framework presented by Hackman and Lawler (1971), as well as the broad theoretical foundation for job enrichment itself, Hackman and Oldham (1975, 1976, 1980) developed and presented the Job Characteristics Model (JCM) in an attempt to organize, refine, and systematize the previously conceived relationships between enriched job characteristics and positive outcomes (see Figure 1 in Chapter 1).

The model includes five core job characteristics which are seen as prompting three critical psychological states which, in turn, lead to beneficial personal and work outcomes. The links between the core job characteristics and the critical psychological states, and between the critical psychological states and the outcomes are said to be moderated by individual knowledge and skill, growth need strength, and satisfaction with the work context. The three critical psychological states are the "causal core" of the model, suggesting that individuals will be internally motivated to perform well when (1) they experience their work as meaningful, (2) they feel they have personal responsibility for the outcome of the work, and (3) they obtain regular and trustworthy knowledge of the

results of their work. Hackman and Oldham (1976:254) summarized the theory of motivation underlying the model in the following way:

The model postulates that an individual experiences positive affect to the extent that he learns (knowledge of results) that he personally (experienced responsibility) has performed well on the task that he cares about [*italics in the original*] (experienced meaningfulness). This positive affect is reinforcing to the individual, and serves as an incentive for him to continue to try to perform well in the future. When he does not perform well, he does not experience an internally reinforcing state of affairs--and he may elect to try harder in the future so as to regain the internal rewards that good performance brings. The net result is a self-perpetuating cycle of positive work motivation powered by self-generated rewards, that is predicted to continue until one or more of the three psychological states is no longer present or until the individual no longer values the internal rewards that derive from good performance.

Five objective job characteristics are viewed as pivotal in leading to the crucial psychological states: skill variety, task identity, task significance, autonomy, and feedback (Hackman and Oldham, 1976, 1980). Skill variety is the degree to which a job requires a variety of different activities in carrying out the work, which in turn involve the use of a number of different skills and talents by the individual. Task identity refers to the extent to which the job requires completion of a "whole" and identifiable piece of work, that is, doing a job from beginning to end, with a visible outcome. Task significance is the degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external

environment. These three characteristics of the job contribute to how meaningful the employee perceives the work to be. Autonomy is defined as the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling work and in determining the procedures to be used in carrying it out. To the extent that autonomy is high, work outcomes will be viewed by workers as depending substantially on their own efforts, initiatives, and decisions, rather than on the adequacy of instructions from the boss or in a manual of procedures. In such circumstances, individuals should feel strong personal responsibility for both successes and failures that occur on the job. Feedback from the job refers to the degree to which carrying out work activities required by the job results in the individual's obtaining direct and clear information about the effectiveness of his or her performance.

It is possible to combine the five job characteristics into a single index that reflects the overall "motivating potential" of a job (the degree to which a job will prompt high internal work motivation on the part of the incumbents). The scores from the five core job characteristics may be combined into a single index called the Motivating Potential Score (MPS) which reflects the overall potential of a job to result in high internal work motivation on the part of the individuals performing the job (see Figure 4).

$$\text{Motivating Potential Score (MPS)} = \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Feedback}$$

Figure 4. Formula for Computing the Motivating Potential Score (MPS) of a Given Job

Source: J. R. Hackman and G. R. Oldham, Work Redesign (Reading, Massachusetts: Addison-Wesley, 1980), p. 306.

Hackman and Oldham (1980) emphasized that for a job to possess a high level of motivating potential, it must be high on at least one of the three job characteristics that related to experienced meaningfulness. It must be high on both autonomy and feedback, thus creating conditions that arouse all three critical psychological states. A diagnostic instrument, the Job Diagnostic Survey (JDS) is utilized to yield the scores for each job characteristic. This instrument is described in detail in Chapter 4.

Some employees are very internally motivated on jobs registering a high MPS, while others are not. Hackman and Oldham (1980) presented three moderating variables that represented a significant aspect of the Job Characteristics Model and served to predict who would and who would not respond positively to high MPS jobs: (1) knowledge and skill, (2) growth need strength, and (3) satisfaction with the work content.

Knowledge and skill. The basic assumption of internal motivation is that positive feelings follow good performance and negative feelings follow poor performance.

If a job is low in motivating potential, then internal motivation will be low, and one's feelings will not be affected much by how well one does. If, however, a job is high in motivating potential, good performance will be highly reinforcing and poor performance will lead to unpleasant feelings (Hackman and Oldham, 1980). People who have enough knowledge and skill to perform well, coupled with jobs high in motivating potential, will experience positive feelings as a result of their work activities. Those people who possess insufficient knowledge and skill to perform well, however, will experience unhappiness and frustration at work.

Growth need strength. Jobs high in motivating potential create situations for considerable self-direction, learning, and personal accomplishment at work. Not all individuals appreciate such opportunities, even those employees who are able to perform the work very competently (Hackman and Oldham, 1980). Some employees have strong individual needs for personal accomplishment, learning, and developing themselves beyond their present state. These people are said to possess strong "growth needs" and are expected to develop high internal motivation when working on a complex, challenging job. Others have weaker needs for growth and will be less eager to utilize the opportunities for personal accomplishment given by a job high in motivating potential (Hackman and Oldham, 1976).

Hackman and Oldham (1980) stated that growth need strength (GNS) moderated at two points in the model. Growth need strength moderates the relationship between the core job characteristics and the psychological states, so individuals with high GNS will have a stronger experience of the psychological states when the job in question is good than will their low GNS counterparts. Growth need strength also moderates the relationship between the psychological states and the outcome variables, suggesting that people with high GNS will respond more positively to the psychological states (when present) than will low growth need individuals.

It is for these reasons that Hackman and Oldham (1980) predicted that individuals with strong needs for growth should respond eagerly and positively to the opportunities provided by enriched work. Individuals with low needs for growth, on the other hand, may not recognize the existence of such opportunities, may not value them, or may even find them threatening and resist being "pushed" too far by their work.

Satisfaction with the work context. The first two moderators focused on the motivating properties of the work itself and on characteristics of the individual employees that affected how they responded to jobs that were high or low in motivating potential. The satisfaction level of employees with respect to their work context may

also affect their willingness or ability to take advantage of the opportunities for personal accomplishment provided by enriched work. The underlying assumptions of the JCM suggest that individuals who are relatively satisfied with pay, job security, co-workers, and supervisors will respond more positively to enriched and challenging jobs than individuals who are dissatisfied with these aspects of the work context. If individuals who are satisfied with the work context also have relatively strong growth need strengths, then a very high level of internal work motivation would be expected to exist (Hackman and Oldham, 1980). Conversely, employees who are both dissatisfied with the work context and low on personal growth need may be only minimally affected by the motivational characteristics of the jobs they do. They are likely to be distracted from whatever richness exists in the work itself (because of their dissatisfaction with contextual factors) and also to be oriented toward satisfactions other than those that can come from effective performance on enriched jobs (because of their low need for personal growth at work). Research by Oldham (1976) and Oldham, Hackman, and Pearce (1976) provided support for the proposition that the impact of a job on a person was moderated both by the person's needs and by his or her work context satisfaction.

Essentially, job characteristics theory states that the more the individual experiences meaningfulness, responsibility, and knowledge of results, the greater will

be his or her personal work motivation, quality of performance, and work satisfaction. However, individual differences in skill, knowledge, personal needs for growth, and satisfaction with the work context are recognized as influences affecting the impact of job characteristics on work behavior and attitude. The theory provides a diagnostic model for measuring both job characteristics and employees' attitudes and needs prior to the redesign of work (Hackman and Lee, 1979).

JCM Implementing Principles for Work Redesign

Five principles for implementing work redesign were described by Hackman et al. (1975) and Hackman and Oldham (1980). This set of action steps, based on the JCM, prescribes in concrete terms what to do to make jobs more motivating for the people who perform them. The five implementing principles are: (1) combining tasks, (2) forming natural work units, (3) establishing client relationships, (4) vertically loading the job, and (5) opening feedback channels. "Each one is a specific action step aimed at improving both the quality of the working experience for the individual and his work productivity" (Hackman et al., 1975:62).

The links between the implementing principles and the core job characteristics are shown in Figure 5, the Job Characteristics Model (JCM), which ranges from the implementing principles through the core job characteristics

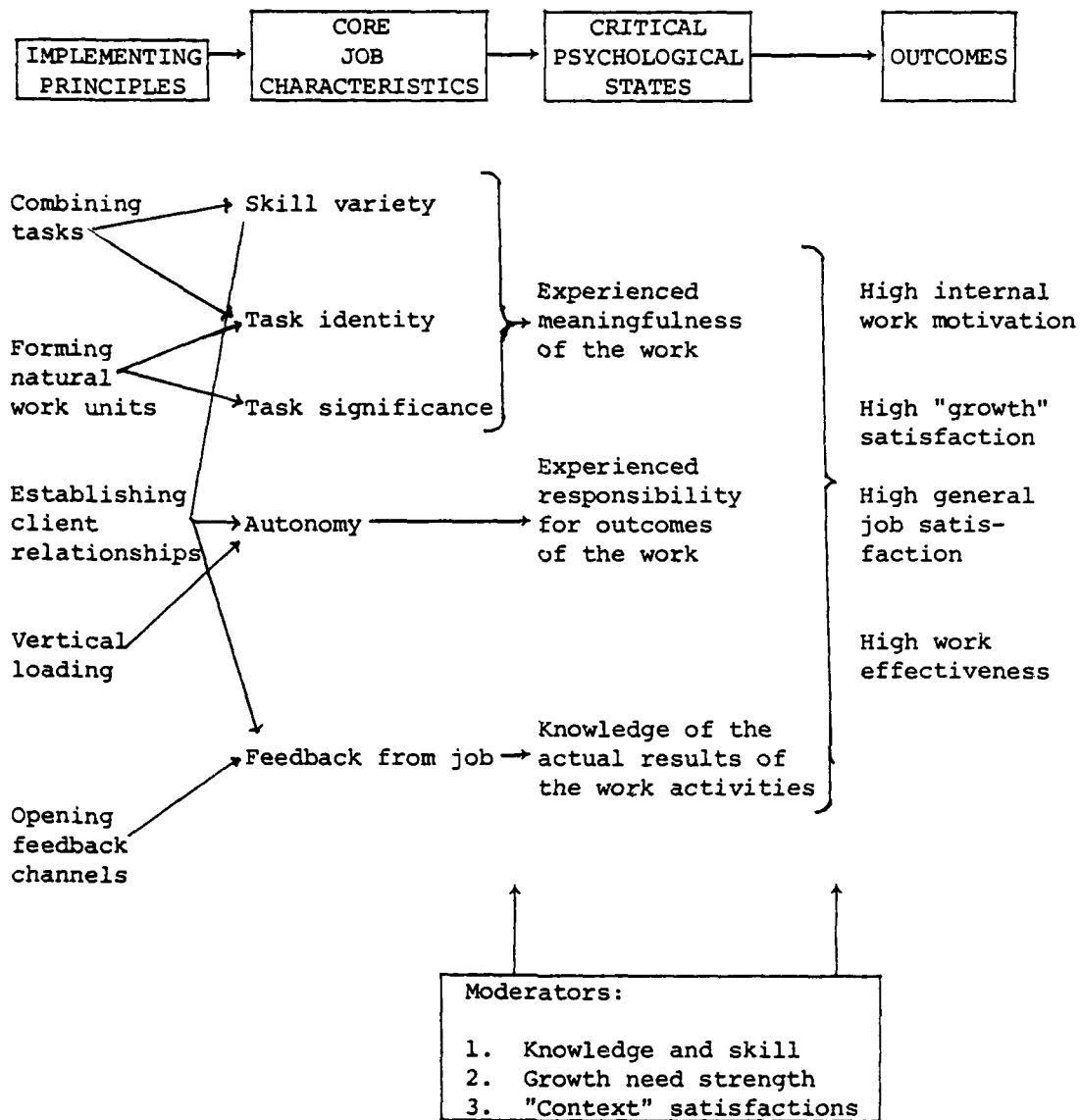


Figure 5. The Full Model: How Use of the Implementing Principles Can Lead to Positive Outcomes

Source: J. R. Hackman and G. R. Oldham, Work Redesign (Reading, Massachusetts: Addison-Wesley, 1980), p. 135.

and the critical psychological states to the actual personal and work outcomes. As shown in Figure 5, each of the principles is particularly powerful in affecting the standing of a job on one or more of the core job characteristics.

Combining tasks. The principle of combining tasks suggests that, whenever possible, existing and fractionalized tasks should be put together to form new and larger modules of work. This increases both the skill variety and task identity of a job. When tasks are combined, all tasks required to complete a given piece of work are performed by one person rather than by a series of individuals who do separate, small parts of the job. When a number of tasks are combined to form a single large module of work, skill variety almost invariably increases. Moreover, task identity often improves as well because the employee is able to identify with the complete product or service (Hackman and Oldham, 1980). Hackman et al. (1975) noted that some tasks, if combined into a meaningfully large module of work, were more than an individual could do by himself. In such cases it is often useful to consider assigning the new, larger task to a small team of workers who are given great autonomy for its completion.

Forming natural work units. The principle underlying the formation of natural units of work is "ownership" --a worker's sense of continuing responsibility for an

identifiable body of work (Hackman et al., 1975). Two steps are involved in creating natural work units. The first is to identify the basic work items, and the second is to group the items in natural categories. When work is formed into natural units, the items of work handled by employees are arranged into logical or inherently meaningful groups. The ownership fostered by natural units of work can make the difference between a feeling that work is meaningful and rewarding and the feeling that it is irrelevant and boring. Because an employee whose work is assigned naturally rather than randomly has a much greater chance of performing a whole job to completion, that employee will have exact knowledge of what the product of the work is (task identity). Furthermore, over time the employee will develop a growing sense of how his or her work affects co-workers (task significance).

Establishing client relationships. Hackman and Oldham (1980) stated that one consequence of fractionalization of work was that the typical worker had little or no contact with (or even awareness of) the ultimate user of his or her product or service. Contact in terms of the JCM is not a simple matter of recognizing and meeting the ultimate user. For real job enrichment it involves work accomplishing interaction between worker and client. By encouraging and enabling employees to establish direct relationships with the clients of their work, improvements

often can be realized simultaneously on three of the core job characteristics. Feedback increases because of additional opportunities for individuals to obtain direct and immediate praise or criticism of their work outputs from the persons who receive the work. Skill variety increases because of the need to develop and exercise interpersonal skills in maintaining the client relationship as well as technical skills in completing the task itself. Autonomy also increases because individuals have personal responsibility for deciding how to manage their relationships with the clients.

According to Hackman and Oldham (1980), creating client relationships is a three step process. First, the client must be identified. Second, the most direct contact possible between the worker and the client must be established. Third, criteria must be set up by which the client can judge the quality of the product or service received. Whenever possible, the client should have a means of relaying his or her judgments directly back to the worker. The contact between worker and client should be as great as possible and as frequent as necessary to reduce the chance that messages will be distorted or delayed.

Vertically loading the job. When a job is vertically loaded, autonomy increases. Vertical loading is a mechanism for giving workers the responsibility not

only for performing a job, but also for planning and controlling. Hackman et al. (1975) noted that the split between the doing of a job and the planning and controlling of the work evolved along with horizontal fractionalization, and once again, the excess of specialization that emerged resulted in unexpected but significant costs in motivation, morale, and work quality. In vertical loading, the intent is to partially close the gap between the doing and the controlling parts of the job, and thereby reap some important motivational advantages. Workers can be given increased control over the work by "pushing down" responsibility and authority that formerly were reserved for higher levels of management.

Hackman et al. (1975) identified this as the single most crucial work redesign implementation principle. They stated that in some cases, where it had been impossible to implement any other changes, vertical loading alone had significant motivational effects.

There are several ways to vertically load a job. Jobholders can be given discretion in setting schedules, determining work methods, deciding when and how to check on the quality of the work produced, and advising or helping to train less experienced workers. Employees can make their own decisions about when to start and stop work, when to take breaks, and how to assign priorities. They can be encouraged to seek solutions to problems on their own by consulting with other organization

members when necessary, rather than calling immediately for the supervisor. In essence, the idea of vertical loading is to advance employees from a position of no authority or highly restricted authority to one of reviewed authority and, eventually, to near total authority for their work. The net effect of such changes in objective personal control should be an increase in workers' feelings of personal responsibility for their work and, ultimately, an improvement in their internal work motivation.

Opening feedback channels. In virtually all jobs there are ways to open channels of feedback to help employees learn how they are performing and whether their performance is improving or deteriorating over time (Hackman and Oldham, 1980). While information about performance effectiveness can be obtained in many important ways, including performance appraisals from all supervisory levels, Hackman and Oldham stressed that it was generally better for workers to learn about their performance directly from doing the job itself.

Job provided feedback usually is more immediate and private than supervisor supplied feedback, and it also increases the workers' feelings of personal control over their work. Moreover, it avoids many of the potentially disruptive interpersonal problems that can develop when the only way workers have to find out how they are doing is through direct messages or subtle cues from

their supervisor.

Hackman and Oldham (1980) stated that exactly what should be done to open channels for job provided feedback varied from job to job and organization to organization. In many cases the changes involve simply removing existing blocks that isolate the worker from naturally occurring data about performance rather than generating entirely new feedback mechanisms. They offered the following suggestions (Hackman and Oldham, 1980:140):

1. Establishing direct relationships with clients.

This often provides the worker with naturally occurring data about how well the product or service provided meets the needs of those who receive it.

2. Placing quality control close to or in the hands of the workers. Quality control efforts in many organizations eliminate a natural source of feedback. The quality check on a product or service is done by persons other than those responsible for the work, and feedback to workers is belated and diluted, if provided at all. This fosters a tendency to think of quality as "someone else's concern." Doing their own quality checks can dramatically increase the quantity and quality of data workers have about their performance.

3. Providing summaries of performance records directly to workers (as well as to their supervisors), thereby ensuring that they have at hand the data they need to improve their performance. Tradition and

established procedure in many organizations dictate that records about performance be kept by a supervisor and transmitted up--not down--the organizational hierarchy. Sometimes supervisors even check the work and correct any errors themselves. The people who made the errors never know they occurred and are denied the very information that could enhance both their internal work motivation and the technical adequacy of their performance.

In summary, opening feedback channels typically involves removing barriers or blocks that isolate the workers from existing information about their work performance. In doing this, the intent is to provide employees with direct, immediate, and regular feedback about their performance effectiveness. If the removal of barriers is not sufficient to provide direct feedback, new feedback mechanisms, such as supervisory feedback, have to be established.

The JCM--A Summary

The Job Characteristics Model (JCM) is a strategy for the redesign of work that is grounded in basic psychological theory explaining what motivates people in their work. It specifies when people will become personally involved and excited about their work, shows what kinds of jobs are most likely to generate such excitement and commitment about work, and describes what kinds of employees it works best for. The model emphasizes that planning for

job changes should be done on the basis of data about the jobs and the people who do them. It therefore provides a diagnostic instrument, the Job Diagnostic Survey (JDS) to collect such data. Finally, the JCM provides a set of specific implementing principles or action steps to guide actual job changes. These theory-based principles, which prescribe in concrete terms what to do to make jobs more motivating for the people who do them, can lead to changes that are beneficial both to organizations and to the people who work in them.

Task Interdependence and
the Job Characteristics
Model

Moses N. Kiggundu (1981) developed the concept of task interdependence and proposed its integration into the Hackman and Oldham (1980) theory of job design and the Job Characteristics Model. Kiggundu (1981:506) stated that:

Although the concept of task interdependence has been discussed in the literature for some time now, few attempts have been made heretofore to integrate its motivating potential. Often, the distinction between social interaction and required task interdependence has not been made. Moreover, recent empirical job design research seems to have neglected the concept, perhaps owing to previous operational problems.

He noted that this was true in spite of the fact that the 1965 study by Turner and Lawrence made serious attempts to deal with task interdependence.

Turner and Lawrence (1965) examined the effect of job enrichment on employee satisfaction and attendance,

and identified six job characteristics that they considered to be important for predicting these employee responses: (1) variety, (2) required interaction, (3) knowledge and skills, (4) autonomy, (5) optional interaction, and (6) responsibility. Several of these task attributes are related to interaction and one specifically relates to required task interaction. In addition, Turner and Lawrence (1965) developed the concept of requisite interdependence as a measure of the necessary interdependence between employees and their work group. They also identified the concept of direction of interaction, by which they meant whether the job required the worker either to initiate or to receive task interactions for or from others. The concepts of required task interaction and direction of interaction provided the basis for the concept of task interdependence which Kiggundu (1981) developed.

Kiggundu (1981:501) identified two types of task interdependence: initiated and received:

Initiated task interdependence is the degree to which work flows from a particular job to one or more other jobs. A person in a job characterized by high initiated task interdependence directly affects the jobs of others. Received task interdependence is the extent to which a person in a particular job is affected by the workflow from one or more other jobs.

He illustrated these concepts with a two-person crew working with an anti-aircraft gun. The first person hands the shells to the second, who in turn loads them into the weapon. Passing the shells by the first person provides the means for the second to fulfill the task requirements

of loading and firing the gun. Therefore, the first person initiates, while the second receives task interdependence. This constitutes an interdependent, rather than dependent, task relationship because the first person could not continue passing the shells unless the second accepted them for loading the weapon.

Kiggundu (1981) felt that the Job Characteristics Model (JCM) would be strengthened by including both initiated and received task interdependence as core job characteristics. In the JCM, autonomy is hypothesized to be the only dimension that leads to the critical psychological state of experienced responsibility for work outcomes. Kiggundu (1981) posited that initiated task interdependence was one other dimension that was related to this critical psychological state. Autonomy and initiated task interdependence make different contributions to total experienced responsibility for work outcomes. Autonomy leads to experienced responsibility for one's own work outcomes, whereas initiated task interdependence leads to experienced responsibility for the work outcomes of others for whom one initiates work. Autonomy and initiated task interdependence together lead to total experienced responsibility. Therefore, persons holding jobs high on both autonomy and initiated task interdependence would experience high total responsibility for their own and others' work outcomes.

Hackman and Oldham (1980) stated that, through

the mediating effects of experienced responsibility, autonomy was positively related to workers' valued personal and work outcomes. Kiggundu (1981) argued that the appropriate mediating variable in these relationships was experienced responsibility for one's own work outcomes. He also claimed that, through the mediating effects of experienced responsibility for others' work outcomes, initiated task interdependence was positively related to the employees' valued personal and work outcomes of internal work motivation, work satisfaction, growth satisfaction, and quality performance.

Figure 6 illustrates the hypothesized relationships and the proposed elaboration of the original Job Characteristics Model (JCM). Autonomy is shown to be directly related to experienced responsibility for one's own work outcomes, whereas initiated task interdependence leads to experienced responsibility for others' work outcomes. Together these two job characteristics contribute to total experienced responsibility. Figure 6 also shows the interplay between the other core job characteristics and their respective psychological states. As in the original formulation (Hackman and Oldham, 1980), all the job characteristics are conceptualized as dimensions independent of one another and contributing to different psychological states.

Although Kiggundu (1981) hypothesized that initiated task interdependence was potentially motivating, he stressed

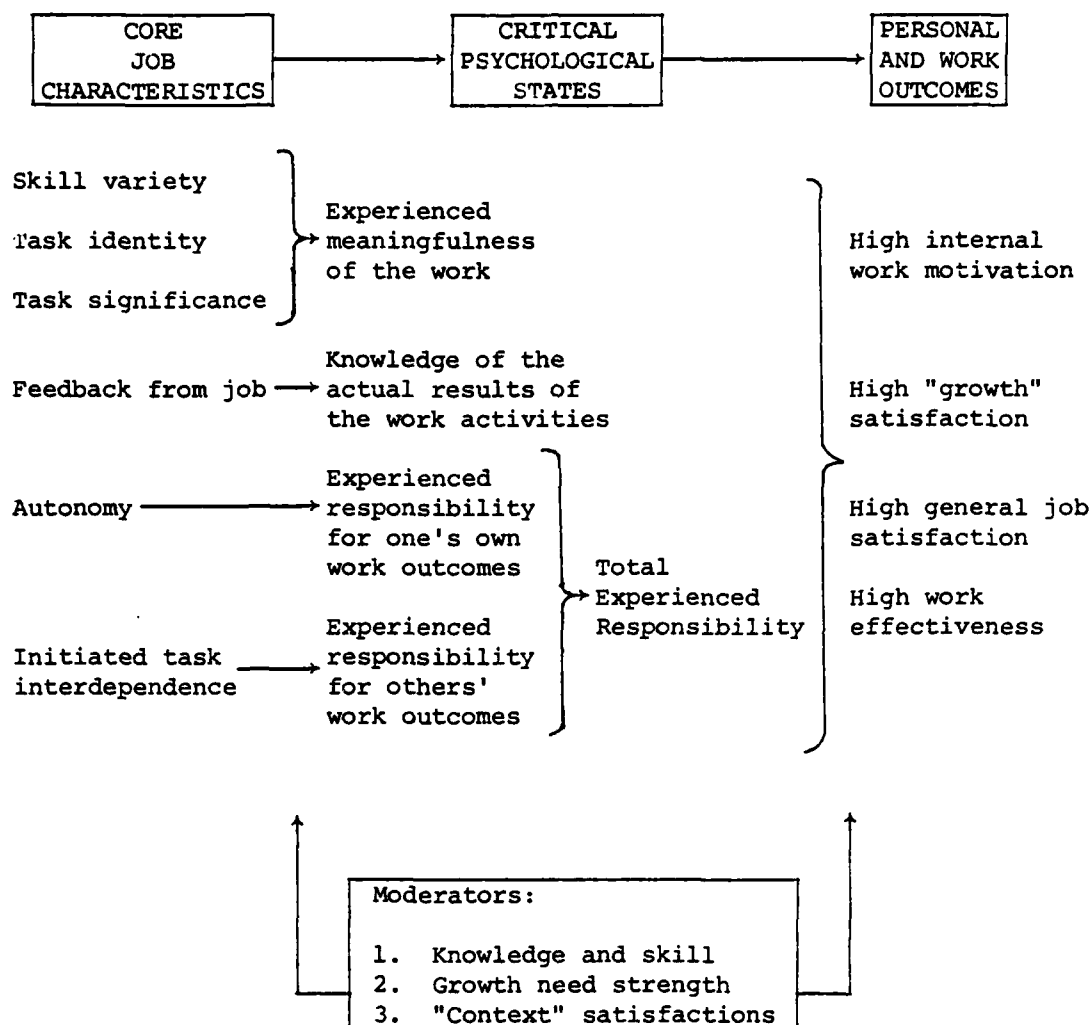


Figure 6. Task Interdependence and the Job Characteristics Model

Source: Moses N. Kiggundu, "Task Interdependence and the Theory of Job Design," Academy of Management Review, VI, No. 3 (1981), p. 505.

that received task interdependence had the opposite effect. There is a negative relationship between received task interdependence and the employees' valued personal and work outcomes of internal motivation, work satisfaction, growth satisfaction, and performance. Although initiated and received task interdependence are conceived of as independent job dimensions, within a closed system, changes in one could lead to corresponding changes in the other. Accordingly, motivation created by increases in initiated task interdependence for one part of the work force could be offset by increases in received task interdependence for the other part. Kiggundu (1981) emphasized that in an open system work situation, workers would be expected to receive and initiate task interdependence both within and outside the boundaries of their work group. In practice, one would not expect receiving and initiating task interdependence to be limited to roles within the immediate work group or organization. These two job characteristics would, therefore, operate independently.

The new variables associated with this extension of the JCM have not been tested. It is necessary, as a start, to develop reliable and valid measures for them. Such scales, combined with the Job Diagnostic Survey (Hackman and Oldham, 1975, 1980), would provide a sound basis for an empirical test of the hypotheses Kiggundu (1981) proposed.

Chapter 3

A REVIEW OF RELEVANT LITERATURE

Drawing on the previous research of Turner and Lawrence (1965) and Hackman and Lawler (1971), Hackman and Oldham (1976, 1980) developed a work redesign theory identified as the Job Characteristics Model (JCM). The JCM identified five core job characteristics which were hypothesized to be related to specific critical psychological states, which were in turn related to personal and work outcomes. The employees' individual differences were accounted for in the model by growth need strength, which moderated these relationships both at the link between the core job characteristics and the critical psychological states, and between these states and the personal and organizational outcomes.

The JCM is the foundation of the present research and this chapter examines the literature on the JCM in two parts. The first part examines literature on the model that is relevant to the: (1) predicted relationship between worker perceptions of the amount of core job characteristics present in their jobs and their affective and behavioral responses to their work, and (2) the mediating effect of the critical psychological states on the relationship

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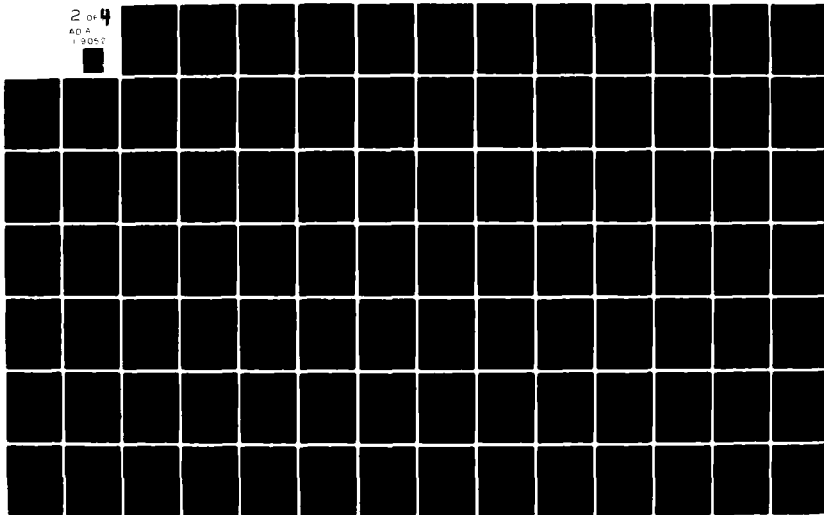
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between the core job characteristics and employee motivation, satisfaction, and performance. The second part of the chapter examines studies which investigated the effects of individual differences on work redesign. The review of the extensive literature on individual differences is a study in itself. Therefore, this section of the chapter is limited to that part of the literature which deals with individual differences as moderators of individual responses to job characteristics, and the degree to which individuals' needs for growth moderate their reactions to "enriched" versus routine work.

A critical review of the literature dealing with work redesign surfaces several problems. Most reported studies are descriptive case studies and are, for the most part, characterized by weak experimental design, poor methodology, lack of adequate control, and inaccurate measurement. Consequently, the generalizability and validity of much of the work redesign research is questionable and, therefore, of limited value. The empirical research generally demonstrated that a positive relationship existed between work redesign and worker response. However, as noted by Pierce and Dunham (1976) and Rosenbach (1977), the theoretical integration as well as the measurement of work redesign is still incomplete.

The JCM and Work Redesign

The Hackman-Lawler Telephone Company Study

Hackman and Lawler (1971) laid the foundation for the testing of the JCM. They investigated the mediating effect of higher order need strength on the relationships between the core job dimensions and employee motivation and performance. The study was conducted in an eastern United States telephone company with 208 employees working in 13 different jobs. Two independent variables were examined: (1) the strength of desire for satisfaction of higher order needs, and (2) the content of the 13 jobs in terms of the four core job dimensions (variety, autonomy, task identity, and feedback). The findings of the study were that: (1) there was a positive relationship between the four core dimensions and overall job satisfaction, (2) satisfaction was greater for jobs high on all core dimensions than for jobs low on the core dimensions, and (3) jobs with a high measured job scope (variety x autonomy x task identity x feedback) were more highly correlated with job satisfaction and intrinsic motivation for workers with high levels of higher order need strength than for workers with low levels of higher order need strength. Employees who rated their jobs highly on the four core dimensions tended to do higher quality work, were regarded as more effective performers, and reported "feeling internal pressures to take personal

responsibility for their work" (Hackman and Lawler, 1971:273). From these results, Hackman and Lawler concluded that the workers' perceptions of their jobs' core dimensions determined their affective responses to their job and that individual differences in higher order need strength mediated between those perceptions and the affective responses.

A Work Redesign Test of the
Hackman-Lawler Theory

Lawler, Hackman, and Kaufman (1973) reported the first work redesign project which attempted to use the Hackman and Lawler (1971) enrichment dimensions. The project redesigned the job of telephone directory assistance operators. As a result of the work redesign, the workers perceived a significant increase in the amount of variety and autonomy in their jobs, but perceived no increase in task identity or feedback. No change occurred, however, in work motivation, job satisfaction, or growth need satisfaction as a result of the work redesign. Lawler, Hackman, and Kaufman (1973) attributed the failure of the project to improve work motivation or job satisfaction to two main factors. First, even after the changes had been made, the directory assistance job was still low on the four core dimensions. Second, and most important, the changes affected only two of the core dimensions, and according to the Hackman-Lawler (1971) theory, a job must be made high on all four core dimensions for

increases in motivation and satisfaction to be realized.

Brief and Aldag's "Constructive
Replication" of the Hackman-
Lawler Study

Brief and Aldag (1975) replicated parts of Hackman and Lawler's (1971) study and found strong support for the presence of positive relationships between workers' perceptions of their jobs' characteristics and their affective responses to those jobs. There were questions, however, on how higher order need strength moderated these relationships. As expected, workers high on higher order need strength displayed a greater relationship between the core job dimensions and affective responses to the work itself than did individuals lower in higher order need strength. However, workers lower in higher order need strength displayed a greater relationship between the core dimensions and affective responses more extrinsic to the work itself than individuals high in higher order need strength. Brief and Aldag (1975) called for more data bearing on the relationship between higher order and lower order need strength and on the extent to which extrinsic rewards vary as a function of the core dimensions. Sims and Szilagyi (1976), and Wanous (1974) found strong support, however, for the Hackman-Lawler measures of the mediating effect of higher order need strength on the relationship between the core job dimensions and worker motivation and performance.

The Travelers Insurance
Company Work Redesign
Project

Hackman et al. (1975) described a work redesign project that involved keypunch operators at the Travelers Insurance Company. Employees involved demonstrated apathy and hostility to the work, output rates were inadequate, due dates were frequently missed, absenteeism and turnover was high, and morale was low. The objectives of the work redesign project were to improve morale and productivity and to test the validity of the Job Characteristics Model (JCM).

Using the work redesign methodology described by Hackman and Oldham (1975), the project was begun by assigning 40 of the 98 operators to the experimental group. The diagnostic phase of the intervention indicated that the operators' jobs were lacking on the core dimensions of the Job Characteristics Model. The job was changed to allow the operators to be responsible for their own accounts and have direct contact with their clients. Operators were allowed to establish their own work schedules, to plan their own day's work, and to correct obvious coding errors on their own. Incorrect work was returned directly to the operator who had accomplished it, and weekly reports on productivity and error rates were routed directly to the operators.

The work redesign effort resulted in an increase of 39.6 percent in productivity for the experimental group

while the control group showed an increase of only 8.1 percent. The total number of operators was reduced from 98 to 60 through attrition, transfer, or promotion. Several operators were promoted to better jobs in departments whose work they had handled. This had never happened before. The quality of work also showed an improvement; the error rate for the experimental decreased from 1.53 percent to .99 percent and the number of poor performers decreased from 11.1 percent to 5.5 percent (no comparisons were made to the control group for quality of work). Job satisfaction as measured by the Job Diagnostic Survey (JDS) (Hackman and Oldham, 1975) improved by 16.5 percent in the experimental group whereas the control group improved only 0.5 percent. General job satisfaction had been almost identical at the beginning of the experiment. Absenteeism decreased 24.1 percent in the experimental group but increased 29 percent in the control group. Cost savings for the first year were computed to be \$64,305.00.

This project provided support for the thesis that work redesign results in improved productivity as well as job satisfaction, quality of work, and work attendance. The results of this study must be viewed with caution, however, since results were stated only in percentages and no tests of statistical significance were reported.

Early Research on the JCM

Hackman and Oldham (1976) empirically tested their

model using data from 658 employees working on 62 different jobs in seven business organizations located in the east, southeast, and midwest. The jobs were heterogeneous, including blue collar, white collar, and professional work in both industrial and service organizations. The primary data collection instrument was the Job Diagnostic Survey (JDS) (Hackman and Oldham, 1975). The objective of the study was to investigate the mediating effect of the critical psychological states on the relationship between the core job characteristics and employee motivation and performance. The results generally offered strong support for the validity of the Job Characteristics Model (JCM). Hackman and Oldham (1975) reported substantial support for the basic relationship between the job characteristics and the outcome measures, although absenteeism and work performance correlated less significantly with the job characteristics than did the affective outcomes. The study suggested that all three critical psychological states were necessary to maximize the outcomes, and the relationships between the core job characteristics and personal and work outcomes were dependent upon the critical psychological states. The results strongly supported this feature of the JCM; by controlling for the mediating effects of the critical psychological states, the correlations between core job characteristics and outcomes were reduced to near zero. The study also supported the proposition that individual growth need strength had a

moderating influence on the relationships between the core job characteristics and the critical psychological states and between the critical psychological states and personal and work outcomes.

Oldham (1976) produced further evidence of the effect of growth need strength on the relationships between the core job characteristics and internal work motivation. His data were obtained from 60 employees in an accounting division of a manufacturing company, again using the Job Diagnostic Survey (JDS). Oldham, Hackman, and Pearce (1976) used the Job Diagnostic Survey to examine the moderating effects of both employee growth need strength and satisfaction with the work context. Results indicated that employees who had strong growth needs and were satisfied with the environmental context in which they worked (satisfied with pay, job security, co-workers, and supervision) responded more positively to enriched jobs than did employees with weak needs and/or who were dissatisfied with the work context.

Umstot, Bell, and Mitchell (1976) studied the effects of job enrichment and goal setting on employee productivity and satisfaction in a simulated laboratory experiment. In addition, the moderating effect of growth need strength was investigated. In the experiment, which employed a 2 x 2 fixed effects design with a pretest and a posttest, temporary, part-time employees performed a task involving the determination of zoning codes. The experimental

manipulation consisted of enriching the job or adding specific task goals. The dependent variables were productivity (output per hour) and job satisfaction (measured by the Job Descriptive Index). The results of the study demonstrated that individuals working in enriched jobs were significantly more satisfied than individuals working in unenriched jobs. Job enrichment had a substantial impact on satisfaction, but little effect on productivity. The addition of specific task goals, on the other hand, increased productivity significantly, but had little effect on satisfaction. The analysis of growth need strength was inconclusive. The shortcomings of this study were the nature of the subjects (college students and unemployed college graduates) and the task (a white collar task), which limited its generalization to a blue collar setting.

Literature Reviews on Work Redesign Research

Pierce and Dunham (1976) concluded from a thorough review of the work redesign literature available through the beginning of 1976 that the empirical research suggested that work redesign often had a positive relationship with various worker responses, especially satisfaction. Motivational responses were found to be commonly related to task characteristics while performance was least strongly and consistently tied to work redesign. No single moderating variable between work redesign and outcomes had been found to explain the fact that in every study some workers

responded substantially more favorably to enriched jobs than did others. Pierce and Dunham (1976) identified a number of problems in the research they reviewed. There existed a common failure to measure work redesign objectively and an overreliance on the perceptions of job incumbents. The direction of causality from work redesign to employee response implied in the literature "stands as a relatively untested assumption" (Pierce and Dunham, 1976:87). Furthermore, experimental studies employed a minimal level of research design quality.

Pierce and Dunham (1976:94) stated that design problems were evident in the research reviewed.

Most investigations were one-shot studies. The internal validity of one-shot designs is potentially contaminated and external validity is minimal. In some studies, the unit of analysis did not seem appropriate, given the stated research objectives. For example, many studies discussed individual differences yet made sociological level measures; others discussed individual responses but obtained measures of group responses. Several studies claimed to investigate task design-response relationships but failed to measure a priori task design characteristics. Finally, many studies utilized self-report measures for both dependent and independent variables, thus increasing the probability of artifactual task design-response relationships.

Task design researchers have generally not attempted to differentiate conceptually or empirically the role of the dependent variables in associations with task design. It is not clear if affective, behavioral and motivational responses are equally affected. These conceptually distinct responses should be treated as such.

In a 1977 review article, Steers and Mowday distinguished between two types of work design research. Field experiments, which evaluated the actual implementation

of work redesign in organizations, usually generated evidence of a positive relationship between work redesign and employee satisfaction and motivation. Steers and Mowday (1977) found, however, that most of these were not high quality experiments, suggested by the fact that many were supported only by anecdotal evidence. A second type of research, correlational studies, examined the relationships between perceived job characteristics and employee reactions at a single point in time. These studies generally supported a positive relationship between work redesign and increased satisfaction and performance, as well as decreased turnover and absenteeism. These studies did not, however, measure employee responses to changes and therefore did not demonstrate causation.

An Evaluation of the JCM
in Great Britain

Using 47 shop-floor employees in a production department of a confectionery factory in Northern England as work redesign subjects, Wall, Clegg, and Jackson (1978) evaluated the JCM: (1) to determine the applicability of the model of blue collar manual employees with low levels of formal education; (2) to determine the extent to which the original findings of Hackman and Oldham (1976) were replicated with a relatively homogeneous group of shop-floor workers (the JCM was developed on a large and extremely heterogeneous sample of individuals and jobs); and (3) to determine the extent to which the empirical

evidence was consistent with the full three-stage version of the model.

Analyses by zero-order correlation and stepwise multiple regression demonstrated that Hackman and Oldham's (1976) original results were replicated in general and in detail by this study. The relationships predicted by the model between core job characteristics and critical psychological states were strongly supported. The relationships between the critical psychological states and the outcome variables of general satisfaction, internal work motivation, and growth satisfaction were all in the predicted direction and generally reached acceptable levels of statistical significance. The findings with respect to absence and performance were inconclusive. Path analysis of the JCM, however, showed that the evidence, both of the Wall, Clegg, and Jackson (1978) study and that reported by Hackman and Oldham (1976), was not fully consistent with the model. The model's predictions concerning the causal role of the critical psychological states were not supported. Each of the critical psychological states were found to have a different status within the model, with experienced meaningfulness playing an important causal role, knowledge of results an insignificant one, and experienced responsibility falling between the two. The authors concluded, therefore, that the JCM could not be regarded as valid.

The Use of Hierarchical
Multiple Regression
Techniques to Test
the JCM

Arnold and House (1980) argued that the analytic techniques employed by previous researchers to test the JCM were inadequate. They applied hierarchical multiple regression techniques to data collected from 120 personnel in an engineering division of a medium-sized manufacturing organization located in a Midwest urban setting. They were concerned with (1) the validity of the hypothesized two-stage moderating effect of growth need strength, and (2) the validity of the motivating potential score (MPS) formula based on the hypothesis that all three critical psychological states were necessary for internal motivation to exist.

The study found some support for the moderating effect of growth need strength on the job characteristics-psychological states relationship. Growth need strength was not, however, shown to interact with the psychological states in determining outcomes in the manner hypothesized by the theory. Results obtained were not supportive of the MPS formulation; the results did not support the hypothesis that all three critical psychological states were necessary for the existence of internal work motivation. Arnold and House (1980:180) emphasized, however, that the results did not lead to the conclusion that the overall JCM was invalid.

On the whole, the results indicate that the job characteristics and the psychological states are significantly related to various personal and work outcomes. What is at issue is not whether such relationships exist, but rather what form [italics in the original] these relationships take. Future research needs to address the issue of developing and empirically testing alternative plausible theoretical models of the manner in which the psychological states combine to influence the outcome variables.

Hypothesis of a Curvilinear
Relationship Between Work
Redesign and Employee
Responses

While virtually all research had tested for linear relationships, Champoux (1978) hypothesized that a curvilinear relationship existed between job characteristics and psychological states. Champoux stated that job scope expanded too much through work redesign could lead to negative responses. He expected a greater rate of increase in psychological response for jobs small in scope than for jobs broad in scope, hypothesizing that broader jobs might provide excess stimulation, leading to negative outcomes. Employing regression analyses, he found considerable support for the curvilinear nature of internal response, although he found the moderating effect of growth need strength to be linear. Champoux (1978) interpreted his results as suggesting a need for increasing the complexity of the JCM and for reducing high expectations of the potential payoffs from increasing the scope of jobs.

Kiggundu's Test of the JCM
Using Multiple Job Ratings

Kiggundu (1980) noted that the JCM was tested using perceptual measures of the job characteristics obtained from the same respondents who also provided data on their affective responses to their jobs. Hackman and Oldham (1976) tested for the theory by correlating the perceptual measures of the employees' job characteristics with their own job attitudes. They justified use of this approach by arguing that, according to the theory, it was the employees' perceptions of their jobs, rather than the objective characteristics of the job, which determined the employees' affective and behavioral responses to their jobs. Kiggundu (1980) argued that this approach produced a number of potential response biases which made the empirical data so derived rather inconclusive. He was joined in this criticism by Pierce and Dunham (1976).

The purpose of Kiggundu's (1980) study was twofold: (1) to provide empirical evidence relating to the reliability and validity of the Job Diagnostic Survey (JDS) using job ratings from three different sources (the job incumbents, their immediate supervisors, and knowledgeable nominated co-workers); and (2) to provide data for a partial test of the JCM using three multiple ratings of the same job characteristics. Kiggundu (1980) hypothesized that supervisors and co-workers who did not own the jobs being rated but who were closely associated and adequately

informed about the nature of those jobs would provide job ratings relatively free from response biases which the job incumbent would typically be expected to make. He compared and correlated data obtained from 138 employees, 126 of their immediate supervisors, and 100 co-workers with adequate experience or knowledge to be able to rate the job. All worked in a large Canadian financial institution.

The results demonstrated that the various subscales of the JDS were psychometrically adequate, not only when the ratings were done by the job incumbents, but also by their supervisors and their nominated co-workers. The study also provided strong support for the JCM's hypothesized positive relationships between the job characteristics, however rated, and the psychological states and outcomes, even when the incumbents' response biases had been controlled for in the measurement of the job characteristics.

Evans, Kiggundu, and House's
Partial Test of the JCM

Evans, Kiggundu, and House (1979) reported the results of a partial test of the JCM using data collected from 343 assembly line supervisors and managers of a large midwest, urban automobile assembly plant. They found that the core job characteristics were, as the model predicted, positively related to personal and work outcomes. However, most of the correlations, though statistically significant, were quite low. There were no notable differences in the

relationships of the outcome measures with the various job characteristics. This was significant for two reasons. First, several of the outcome measures were not measured using the Job Diagnostic Survey (JDS) (Hackman and Oldham, 1975) but with the Job Descriptive Index (JDI) (Smith, Kendall, and Hulin, 1969). This gave relatively stronger support to the model. Second, the behavioral measures of performance and organizational withdrawal, though measured through surrogate items, had significant relationships with most of the job characteristics. The study provided only weak support for the moderating effect of growth need strength.

Tests of the JCM from Two
Naturally Occurring
Quasi-Experiments

Hackman, Pearce, and Wolfe (1978) emphasized that there was considerable correlational evidence showing relationships between the characteristics of jobs and the work attitudes and behaviors of job-holders, but relatively few studies assessed the causal impact of actual changes in job characteristics. Of the published studies that did examine the effects of job changes, most were explicitly intended to improve employee attitudes and/or productivity. Such evaluative efforts were helpful in increasing knowledge of organizational change processes involving redesign of work, but they were of limited use in furthering understanding of the consequences of changes

in real properties of jobs on attitudinal and motivational outcomes of job incumbents. Hackman, Pearce, and Wolfe (1978:290) stated:

Because job enrichment (and similar programs) always aspire toward improvement [italics in the original] in the motivational makeup of jobs, both the range and the direction of alterations in job characteristics are necessarily restricted. In addition, and of more serious consequence, work redesign activities invariably involve numerous changes that extend well beyond alterations in job characteristics themselves, e.g., revision of compensation practices, placement and promotion policies, superior-subordinate relationships, and so on. While such non-job changes may help ensure the success of a change project (and, indeed, may be instituted specifically to buttress and reinforce improvements made in the job itself), they also increase ambiguity about what actually caused [italics in the original] any changes in work attitudes or behavior that are found.

Perhaps the most damaging criticism of concluding cause-effect relationships from research undertaken to alter affective or behavioral outcomes by means of changing job characteristics was offered by King (1974). King posited that raising "expectation levels" of job incumbents might in effect be the actual cause of altered employee responses. For example, when job design programs were implemented, high expectations that great benefits would accrue sometimes were created by both the change agents and managers. Such expectations had powerful influences on attitudes and behaviors at work, irrespective of real changes in motivational characteristics of the jobs themselves. Identification of such expectation effects in work redesign research reduced the certainty of obtaining valid conclusions about the direct causal impact of changes

in motivational properties of jobs on the employees' attitudinal outcomes.

Two studies assessed the effects of changes in job characteristics in organizational settings where the confounding and contaminating factors identified by Hackman, Pearce, and Wolfe (1978) and King (1974) were reduced. Hackman, Pearce and Wolfe (1978) conducted research on 94 employees performing 49 different clerical jobs in a large metropolitan bank. Because of certain technological innovations, the jobs of all the employees in the organization were redesigned. The change had the effect of objectively "enriching" some of the jobs, of simplifying and routinizing others, and of leading to no significant change in the motivational characteristics of still others. Because the changes were undertaken solely for technological reasons, they were designed and implemented without regard to how "enriched" the jobs were initially. Moreover, neither managers nor employees held expectations that the motivational characteristics of the jobs would be altered. Bhagat and Chassie (1980) reported research conducted using 65 employees of an aircraft manufacturing company whose work schedule was revised from a five-day, 40-hour week to a four-day, 40-hour week. Changes in the characteristics of jobs in the organization which resulted from the shortened work week were introduced without regard for the motivational consequences of the new schedule. As with the Hackman, Pearce, and Wolfe (1978) study, some jobs

were made more complex and challenging, some less so, and the motivational properties of still others were essentially unaffected.

The results of both of these studies provided strong support for the predictions set forth in the JCM. Changes in job characteristics were shown to affect employee reactions to their work as predicted. Employees on jobs that increased in motivating potential exhibited significantly higher job satisfaction, internal work motivation, and growth satisfaction. The reverse was true for employees whose jobs deteriorated in motivating potential, whereas little change was obtained for employees whose work was redesigned in a way that minimally altered the motivating potential of their jobs. High growth need strength employees responded more sensitively and predictably to changes in the motivational properties of their jobs than did low growth need strength employees.

The results of the two studies corroborated the results of previous studies in which static correlational methods were used to assess the relationships between job characteristics and employee reactions to their work. Because the changes were made by management without regard for the motivational properties of the work, employee expectations about possible improvements in their jobs were not raised. Moreover, neither compensation practices nor supervisor-subordinate relationships were redesigned as part of the change. This was in contrast with frequent

practices of work redesign projects. For these reasons, Hackman, Pearce, and Wolfe (1978), and Bhagat and Chassie (1980) defined their studies as naturally occurring quasi-experiments and concluded that real changes in core job characteristics were indeed causally responsible for the observed changes in outcome measures.

Orpen's Longitudinal Field Experiment

Orpen (1979) investigated the effect of work redesign on employee responses in a field experiment conducted in a federal agency among 72 clerical employees who were randomly assigned to either an enriched or unenriched group. Orpen (1979) systematically changed the job content of the enriched group to increase each of the job characteristics of skill variety, task identity, task significance, autonomy, and feedback from the job. The employees in the unenriched group continued performing their original duties and tasks. After a six month experimental period, the effect of work redesign was examined.

The results from the field experiment offered strong support for the Job Characteristics Model (JCM) and indicated clearly that work redesign could produce substantial benefits for the employee and the organization. Orpen (1979) reported a number of significant results. Employees whose job content had been redesigned perceived their jobs as higher in the core job characteristics, whereas those whose job content was unaltered did not.

For personal outcomes, the levels of job satisfaction, job involvement, and internal work motivation were each significantly higher among employees whose jobs were enriched than among employees whose job content remained unaltered. For work or organizational outcomes, the rates of absenteeism and turnover were both significantly higher among employees whose job content remained unaltered than among employees whose jobs were enriched. Data indicated that the work redesign caused employees to hold more positive attitudes toward their jobs, which made them less likely to want to avoid the work situation, by either being absent or resigning. Contrary to expectations, however, Orpen (1979) reported that the work redesign had little effect on performance or productivity, whether assessed by supervisors' ratings or by actual output. This agreed with the findings of Umstot, Bell, and Mitchell (1976).

Orpen's (1979) study strongly supported the Hackman and Oldham (1976, 1980) and Oldham, Hackman, and Pearce (1976) statements regarding the moderating effects of employee growth need strength and satisfaction with contextual aspects of the work situation. As predicted by the JCM, both growth need strength and contextual satisfaction were found to moderate the relationship between the job characteristics and the personal and work outcomes. The job characteristics-outcome relationships were generally stronger among employees with strong

rather than weak growth needs, and among employees who were satisfied rather than dissatisfied with their jobs. Also, the process of work redesign had a much stronger and more favorable impact on the job attitudes of employees whose growth needs were strong rather than weak, and of employees who were satisfied rather than dissatisfied with the contextual aspects of their work situation.

Orpen's (1979) findings provided evidence that work redesign could cause substantial improvements in employee attitudes but not impact strongly on performance or productivity. He suggested, therefore, that in order to explain the effect of work redesign on performance, it was necessary to consider other factors besides the psychological states produced by jobs seen to have certain characteristics.

Work Redesign and Behavioral Responses

Hackman and Oldham (1976) argued that the appropriate matching of individuals and tasks would enhance satisfaction, motivation, and productivity. In their most recent presentation of the Job Characteristics Model (JCM) (Hackman and Oldham, 1980) performance or work effectiveness was also included as a specific outcome variable. Work effectiveness was presented as consisting of both quality and quantity of output. The rationale for assuming a quality relationship was that "when a job is high in motivating potential, people who work on that job tend

to experience positive affect when they perform well" (Hackman and Oldham, 1980:91). The quantity prediction was based on three factors: (1) jobs high in skill variety, task identity, task significance, autonomy, and feedback were generally not routine and boring, so employees were not as likely to search for ways of avoiding work; (2) as a result of task changes aimed at increasing task scope, hidden inefficiencies in the work system were often corrected; and (3) such changes often simplified and refined the total work system.

Two reviews examined in general terms the relationship between task design variables and employee performance postulated by Hackman and Oldham. Pierce and Dunham (1976) summarized 10 studies involving main effects between task design and performance and five additional studies dealing with interactions among task design and individual differences and performance. Also included in the review were studies dealing with other outcome variables, such as satisfaction and motivation. Pierce and Dunham (1976) noted that affective and motivational responses were more strongly and consistently related to task design than were behavioral responses, and that satisfaction with the job was more strongly related to task design than were other affective, behavioral, or motivational variables. They concluded, however, that in all but one of the investigations reviewed, evidence suggested improvements in work related behavior associated with work redesign.

In a more recent but less thorough review, Mowday (1978) argued that despite moderate empirical support for a task design/performance relationship, critical questions remained unanswered. He also noted that even where predicted relationships were found, the results were often so weak as to be of little practical value, or subject to alternative explanation.

Griffin, Welsh, and Moorhead (1981) conducted a literature review of empirical studies relating perceived job characteristics to employee performance. Thirteen studies were included in the review. The results of this review were contradictory and inconclusive: five of the studies provided support for a job characteristics/performance relationship, three provided mixed support, and five provided no support for the predicted relationship. Six studies using the Job Diagnostic Survey (JDS) as a measure of perceived job characteristics produced inconclusive results. Hackman and Oldham (1976), Oldham, Hackman, and Pearce (1976), and Evans, Kiggundu, and House (1979) all reported significant correlations between job characteristics and performance, while Umstot, Bell, and Mitchell (1976), Orpen (1979), and White and Mitchell (1979) found no significant relationships.

Two more recent studies (Oldham and Hackman, 1981; Brass, 1981) investigated the role of job characteristics as mediating variables in the relationships between organizations' structural contexts and the attitudes and behaviors

of individual employees. The results demonstrated that the structural relationships investigated related significantly to the job characteristics, which in turn related significantly to employee satisfaction and performance. These studies strongly suggested that job characteristics were important links between the organizational context and individual responses.

After finding no significant relationships between perceived job characteristics and productivity for 107 employees of a nonunionized manufacturing plant located in a large southwestern city, Griffin (1981:112) concluded:

There are three possible explanations for these findings: (1) The index of productivity utilized by the organization is not a valid measure of individual performance, (2) Task characteristics are not related to productivity, or (3) Task design is but one variable among many that interact to determine performance. That is, taken apart from the other variables, task characteristics may not account for enough variance in performance to reflect a significant correlation. This explanation appears more tenable than either of the other two and reinforces the previous argument for an expanded framework for task design research.

Griffin, Welsh, and Moorhead (1981) summarized their literature review on perceived job characteristics and employee performance by emphasizing that the results were inconclusive and contradictory. They emphasized that employee performance was not measured in exactly the same way in even two studies. Consequently, even if results were clearcut, it would be difficult to make valid generalizations.

Studies examining relationships between employee perceptions of their jobs and subsequent turnover and absenteeism incidents were much more supportive of JCM predictions, although results involving the moderating effect of growth need strength were less conclusive. Mowday and Spencer (1981) examined the job characteristics and absenteeism/turnover relationships of 569 employees working in health care and clerical jobs in seven agencies of state and county government in a midwestern state. As expected, job scope was significantly related to withdrawal behaviors. Employees who perceived their jobs to have high levels of skill variety, task identity, task significance, autonomy, and feedback exhibited lower levels of turnover and absenteeism than did employees who perceived their jobs to be low in job scope. Mowday, Stone, and Porter (1979) also found support for the predicted relationship between perceived job scope and the amount of employee turnover.

The influence of employee growth need strength on the job scope/withdrawal behavior relationships was much less clear. Mowday and Spencer (1981) found no significant influence of growth need strength on employee turnover, but Mowday, Stone, and Porter (1979) reported a significant relationship. Moreover, Mowday and Spencer found that employee growth need strength significantly moderated the job scope/absenteeism relationship. This finding was consistent with theory, but not the empirical

findings of Hackman and Oldham (1976), who found no difference in the relationship between job characteristics and absenteeism for employees with low versus high growth need strength.

Work Redesign and Individual Differences

Herzberg and his associates (Herzberg, Mausner, and Snyderman, 1959; Herzberg, 1966, 1976; Paul, Robertson, and Herzberg, 1969) emphasized that job enrichment changes should be made nonselectively, without regard for individual differences. They also stressed that there should be no participation by jobholders themselves in deciding what changes were to be made in their jobs. Herzberg (1966) asserted that when people took part in deciding how to change their jobs, the results were disappointing. Paul, Robertson, and Herzberg (1969:75) concluded, as a result of their study, that "the existence of individual differences is no bar to investigating the possibilities of job enrichment." In addition, it was their view that it was improper to decide before the event who deserved to have his job enriched and who did not. Ford (1969) and others who based their work redesign efforts on Herzberg's theory espoused similar views and generally ignored individual differences.

The notion that individual differences played an important role in determining workers' reactions to the scope of their jobs became prominent with the work of

Turner and Lawrence (1965) who showed that the relationship between job scope (defined by them as the degree to which a job possessed various "enrichment" dimensions such as autonomy, variety, or identity) and employee job satisfaction and absenteeism was different depending on whether data were obtained from urban or rural workers. The publication of Hackman and Lawler's (1971) monograph later shifted the focus of individual differences from the sociological level to the psychological or individual level, and led to the exposition of Hackman and Oldham's (1976, 1980) formal theory of job design. While Hackman and Oldham's theory hypothesized the interacting effects of a higher order need strength (growth need strength) specifically, other investigations sought alternative moderator variables with mixed results. Such variables included: (1) alienation from middle class norms (Blood and Hulin, 1967; Hulin and Blood), (2) endorsement of the Protestant Work Ethic (Mirels and Garrett, 1971; Merrins and Garrett, 1975; Stone, 1976), and (3) extrinsic or intrinsic work values (Friedlander, 1965; Robey, 1974).

The Research of Turner
and Lawrence, and
Blood and Hulin

A study by Turner and Lawrence (1965) demonstrated that cultural or sociological differences were related to workers' responses to their jobs. In a study involving 500 workers in 47 jobs from 11 different organizations,

they hypothesized that job satisfaction would be related positively to the requisite task attributes (job characteristics) of variety, autonomy, required interaction, optional interaction, knowledge and skill required, and responsibility. They found that their hypothesis was supported for workers with small town or rural backgrounds, but not for urban workers. Turner and Lawrence (1965) explained the difference in terms of the urban workers' "anomie" or societal normlessness, a lack of purpose, identity, ethical values, or group norms.

Blood and Hulin (1967) found that workers' reactions to their jobs and the associated characteristics were related to their acceptance or rejection of middle-class norms, including the "Protestant Work Ethic." They also found that rural workers responded more favorably to work redesign than urban workers. Blood and Hulin (1967) explained the difference between the responses of rural and urban workers not so much as a "lack of" but as an "alienation from" middle-class work values and the dominant norms of society among the urban workers. They formulated a construct, conceived as a continuum running from integration with middle-class norms to alienation from middle-class norms, to be used in structuring and predicting workers' responses to their jobs. Blood and Hulin (1967:285) stated:

At the integrated end of the construct are found workers who have personal involvement with their jobs and aspirations within their occupations.

Their goals are the type of upward mobility, social climbing goals generally associated with the American middle-class. At the opposite pole of the construct, workers can be described as involved in their jobs only instrumentally; that is, the job is only a provider of means for pursuing extraoccupational goals. The concern of these workers is not for increased responsibility, higher status, or more autonomy. They want money, and they want it in return for a minimal amount of personal involvement.

Hulin and Blood (1968) and Hulin (1971) recognized that not all workers were interested in performing demanding jobs. Some workers handled demanding jobs effectively and were reinforced by successful accomplishment, while others were not able to perform and became discouraged. They posited an inverted-V relationship between job content and job satisfaction (Figure 7), with the optimal level of job satisfaction varying for different workers. They attributed the variance to individual differences which were to be found in various subgroups in society.

Employees with a strong desire for and ability to perform demanding jobs (Case 1) found the highest level of job satisfaction when their jobs were heavily enriched and complex, whereas workers with a lower desire for and limited ability to perform demanding jobs (Case 3) found their optimal levels of job satisfaction when their jobs were relatively simple. Employees with moderate desires and abilities found their optimal levels of job satisfaction with a moderately complex and enriched job. Hulin (1971:165) stated that "there exists identifiable subgroups of workers within the American work force whose motivations to work are

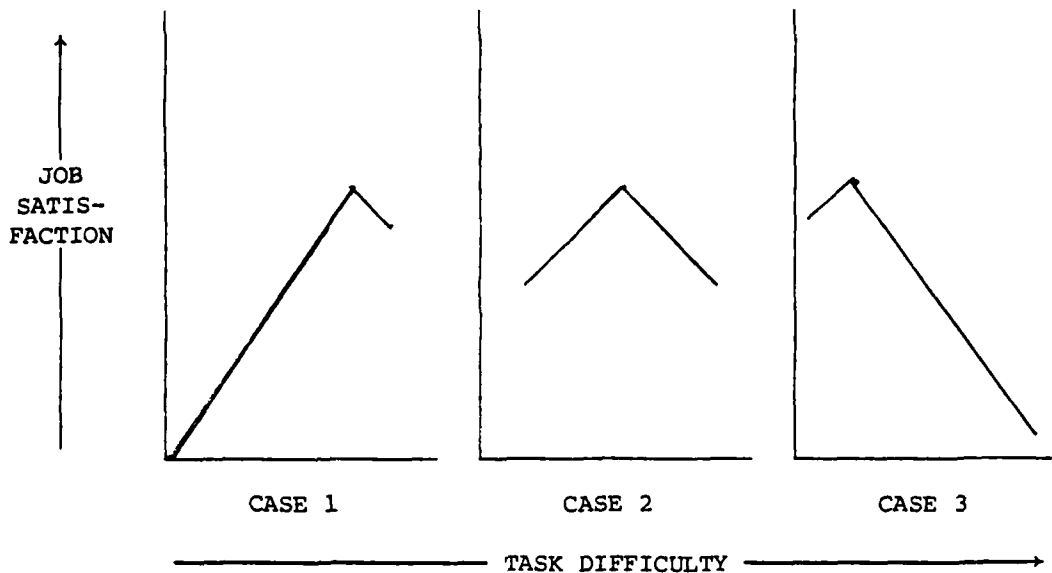


Figure 7. Relationship Between Job Satisfaction and Task Difficulty
(Job Variety, Autonomy, Skill Requirements)

Source: C. L. Hulin, "Individual Differences and Job Enrichment--The Case Against General Treatments," New Perspectives in Job Enrichment, ed. J. R. Maher (New York: Van Nostrand, 1971), pp. 166-67.

predictably and lawfully different from the general work motivation assumed by the job enrichment proponents."

Hulin (1971) recommended that research focus on determining the variables that differentiated between the subgroups and on determining the job characteristics which served as positive sources of motivation for the different, independently defined work groups.

Additional Research on Rural and Urban Workers

Shepard (1970) studied the moderating effect of urban versus rural socialization on the task design-job satisfaction relationship. Following the lead of Blood and Hulin (1967), he arbitrarily classified communities of less than 5,000 population as integrated with middle-class norms and larger communities as alienated from middle-class norms. He found the community of socialization did not moderate the task design-worker response relationship. He concluded that alienation from middle-class norms was not important and that "alienated or not, a worker's job satisfaction increases with job size" (Shepard, 1970:217).

Susman (1973) also examined the moderating role of the rural-urban distinction in the design-employee response relationship. He studied 256 workers working in 127 jobs that were "relatively homogeneous by type, technology, and industry" in 26 diverse plants. Employing community size, measured at place of plant location, and

area of youth socialization, Susman (1973) described 11 plants as rural (under 50,000 population) and 15 as urban. He divided his sample of workers into rurals, urbans, and transitionals (rural bred-urban resident or urban bred-rural resident). He found that community size of the plant location served as the stronger moderator, but the moderators did not appear strong enough to alter the basic nature of the task design-employee attitude relationship. Susman (1973:13) concluded that:

The hypothesis that workers of different culture and individual backgrounds respond differently to job enlargement is supported here, but it appears that rural or urban birth or residence is too crude a distinction in American context to expect opposite responses to occur.

Stone and Porter (1973) examined the relationship between job scope and job satisfaction for a sample of workers who worked and lived in urban areas. They reported that work redesign was highly related to satisfaction with the work itself. Because Blood and Hulin (1967) suggested that such relationships should be negative for urban, alienated workers, Stone and Porter (1973) concluded that their results were not supportive of Blood and Hulin's studies.

The Hackman and Lawler Study

A report by Hackman and Lawler (1971) was a major development in the study of employee reactions to job characteristics. They raised the question of how the

relevant differences among workers were to be conceptualized and measured. They proposed that an alternative strategy to dealing with individual differences on a subgroup or sociological level would be to conceptualize and measure the relevant individual differences directly at the individual level of analysis. Hackman and Lawler (1971:261-62) stated:

The town-city conceptualization assumes a substantial homogeneity of worker characteristics and response tendencies for employees within the two cultural settings. To the extent that there are substantial individual differences among town workers and among city workers, an attempt to measure relevant individual differences directly at the individual level would seem to have considerable merit. The difficulty in implementing this alternative approach, or course, is that it requires prior specification on a conceptual level of what specific differences among people are responsible for the results reported by Turner and Lawrence (1965) and Blood and Hulin (1967) i.e., what it is about people that moderates the way they react to their jobs.

Hackman and Lawler (1971) used the term "Higher Order Need Strength" to denote the extent to which individuals' needs corresponded to the upper need categories of Maslow (1954) or Alderfer (1972). They posited that individuals who were capable of higher order need satisfaction would experience that satisfaction when they learned that as a result of their own efforts they accomplished something they considered meaningful and worthwhile. High satisfaction and high effort were considered to result from desires for higher order need satisfaction combined with conditions on the job such that performance would bring about the desired need

satisfaction. Individuals who desired higher order need satisfaction were most likely to obtain it when they performed meaningful jobs well and were provided feedback on the quality of their own work efforts. Higher order need satisfactions were seen by Hackman and Lawler (1971) as both a result of effective performance and an incentive for continued efforts to perform effectively. They saw individual differences in the desire for higher order need satisfaction as the key moderating variable in the relationship between job characteristics and employees' affective and behavioral responses to their work.

In order to test their theory, Hackman and Lawler (1971) rated 13 different jobs of 208 telephone company employees on four core job characteristics (variety, autonomy, task identity, and feedback), measured desire for higher order need satisfaction, and measured the dependent variables of job satisfaction, motivation, performance, and work attendance. They computed separately and compared the relationships between the job characteristics and the outcome variables for the upper and lower third of the employees based on their desire for higher order need satisfaction. They reported that higher order need strength was a key moderating variable on the relationship between work redesign and job satisfaction. A moderating effect on the relationship between job characteristics and job satisfaction appeared for variety, autonomy, and feedback but not for task

identity. Hackman and Lawler (1971) emphasized also that the relationships between the job characteristics and the affective responses of the workers were generally stronger for the higher need strength group than for the total sample and generally weaker for the lower need strength group.

Brief and Aldag (1975) performed a "constructive replication" of the Hackman and Lawler investigation on a sample of 104 rehabilitation employees. They reported that higher order need strength moderated the significant positive correlations between the core job characteristics and the worker responses. Their findings provided strong support for and served to extend the generalizability of the Hackman and Lawler study.

Wanous' Examination of
Three Individual
Difference Measures

Wanous (1974) tested three individual measures which had been investigated as moderators of work redesign-employee response relationships. The three variables were: (1) rural versus urban background (Turner and Lawrence, 1965; Blood and Hulin, 1967), (2) belief in the Protestant Work Ethic (Blood, 1969), and (3) high versus low desire for higher order need satisfaction or higher order need strength (Hackman and Lawler, 1971). Wanous (1974) was primarily concerned with how well each of these variables moderated the relationship between the presence of certain core job characteristics (variety, task identity, autonomy,

and feedback) and employee reactions to these characteristics in terms of satisfaction with a specific job characteristic, general job satisfaction, and job behavior in terms of performance and absenteeism.

The research was conducted in a telephone company with 80 newly hired women telephone operators who volunteered to participate. All of the data were collected by questionnaire for all measures except performance and absenteeism. Job performance was measured by supervisory rating of an individual's quantity and quality of work. Absenteeism was measured by the number of occasions absent, and was extracted from company records.

The results of the Wanous (1974) study indicated that the higher order need strength measure of individual differences seemed to be the best measure when the presence of certain job characteristics were correlated with the specific satisfaction with each characteristic. Eleven of the 12 relationships were statistically significant for the higher order need strength variable whereas only five were significant for the Protestant Work Ethic variable, and only one relationship was significant for the urban-rural background variable. Similar results were obtained when correlations were performed between the four core job characteristics and overall job satisfaction. This relationship was strongly moderated by higher order need strength, less strongly moderated by belief in the Protestant Work Ethic, and only weakly moderated by urban versus rural

socialization. When the individual differences were used as moderating variables in the relationship between the core job characteristics and job behavior (performance and absenteeism), Wanous (1974) found there was virtually no difference among the three measures for their usefulness as moderators. Wanous concluded that higher order need strength was the best moderator of the work redesign-employee response relationship of the three individual difference variables tested. This was followed by belief in the Protestant Work Ethic which showed moderate effectiveness, and by the urban-rural socialization difference which was generally ineffective.

Hackman and Oldham and the
Moderating Effect of
Growth Need Strength

Both Hackman and Lawler (1971) and later Hackman and Oldham (1976, 1980) assumed that characteristics of jobs, such as variety, feedback, and autonomy, could be viewed as job outcomes by the employees. In order to explain how positively or negatively valent such outcomes were judged to be by the worker, they invoked a need satisfaction approach. Hackman and Oldham (1976, 1980) developed this construct into one termed "Growth Need Strength." In either case, it was theorized that the core job characteristics would be experienced as more positively valent by those workers who had higher order needs. Their model, then, hypothesized some rather specific interactions

between individual differences and job characteristics in explaining worker attitudes and behaviors.

Hackman and Oldham (1976) empirically tested their theory using data from 62 heterogeneous jobs in seven different business organizations. They found that higher order need strength moderated the job characteristics-critical psychological state relationship and the psychological state-employee response relationship. They argued that all employees responded positively to work redesign but workers with strong growth need strength responded most favorably.

Sims and Szilagyi (1976) found that growth need strength had a strong moderating effect on the relationships between work redesign and employee affective and behavioral responses for their sample of paramedical and support personnel at a major midwestern medical center. Oldham (1976) and Oldham, Hackman, and Pearce (1976) also found that workers with high growth need strength responded more positively (with higher levels of motivation and job satisfaction) to jobs high in motivating potential than did individuals with weaker growth need strength. Two studies identified as naturally occurring quasi-experiments (Hackman, Pearce, and Wolfe, 1978; Bhagat and Chassie, 1980) and a longitudinal field experiment (Orpen, 1979) additionally reported findings supportive of the predictions of the JCM on the moderating effect of growth need strength.

Carroll (1978) examined psychological needs as

moderators of employee responses to work redesign. In a field experiment the experimental group's work was upgraded according to skill variety and autonomy. Using various measurement instruments, not including the Job Diagnostic Survey (JDS) (Hackman and Oldham, 1975), Carroll (1978) found results which suggested no relationship between the psychological needs of the workers and their response to enriched jobs until growth need strength was taken into account. He concluded that work redesign did not in itself result in positive outcomes, but that outcomes were dependent on the existence of higher order needs in the employees.

Abdel-Halim (1979) studied the moderating effect of individual growth need strength on the relationship between work redesign characteristics and intrinsic job satisfaction and job involvement for 89 managerial and professional personnel in a large manufacturing firm in the midwest. In order to assess the extent to which previous research findings were artifacts of methods used, Abdel-Halim used many measures which were different from those used in the original investigations by Hackman and Lawler (1971), Hackman and Oldham (1976), Oldham (1976), and Oldham, Hackman, and Pearce (1976). The results of the study provided strong support for the JCM and previous research findings regarding the moderating effect of individual growth need strength and served to extend the generalizability of the research after which it was

modeled.

Ganster's Laboratory
Experiment

Ganster (1980) conducted a laboratory experiment to test the moderating effects of individual difference variables on work redesign relationships and to disconfirm or corroborate moderator results reported in nonexperimental field studies. He examined four conceptually different individual difference variables, representing general work values (belief in the Protestant Work Ethic), general higher order needs (Growth Need Strength), specific higher order needs (Need for Achievement), and Arousal-Seeking Tendency. Ganster's (1980) rationale for expecting Protestant Work Ethic, Growth Need Strength, and Need for Achievement to moderate work redesign-affective response relationships evolved from the approaches commonly taken by researchers and reported in the literature. His rationale for using the conceptually different individual difference variable of Arousal-Seeking Tendency followed directly from the activation theory view of work redesign (Scott, 1966). Presumably, higher scope jobs would elicit higher levels of state arousal or activation, and workers would differ in their preferred arousal levels.

Ganster (1980) randomly assigned 190 undergraduate students from a large, midwestern university to groups working on either a low scope or a high scope electronic assembly and sorting task. The task scope was determined

through the manipulation of the four core job characteristics of variety, autonomy, feedback, and task identity. The subjects worked on the tasks for 75 minutes and then completed task perceptions and satisfaction measures.

Ganster (1980) found that the subjects' perceptions of task scope as measured by the amount of core job characteristics in their work had a highly significant and substantial ($p < .001$) relationship to job satisfaction. Hackman and Oldham (1976:261) argued that

when the intent is to predict or understand employee attitudes or behavior at work . . . employee ratings of the job dimensions are preferable to use, since it is an employee's own perception of the objective job that is causal of his reactions to it.

Ganster noted that the results of the experiment showed that task perceptions accounted for satisfaction variance over and above that explained by objective task scope, thus lending strong support to Hackman and Oldham's (1976) contention.

Criticizing the technique of subgroup analysis used by most researchers to test moderator variables, Ganster (1980) employed both moderated regression and subgroup analysis to test the effects of the four moderator variables, however, in no case did the subgroup analysis technique indicate a moderator effect. None of the individual difference variables significantly moderated the objective task scope-satisfaction relationship. Neither Protestant Work Ethic, Growth Need Strength, nor Arousal-Seeking Tendency showed evidence of moderating the perceived

task scope-satisfaction relationship. Need for Achievement did, however, but the moderating effects were contrary to those hypothesized. While one would expect the most satisfied individuals to be those with high Need for Achievement scores on high scope tasks, the study showed the most satisfied to be low need achievement individuals who worked on high scope tasks.

In discussing his findings on individual differences and work redesign, Ganster (1980:145) concluded:

The literature strongly suggests that workers in general will respond positive (at least attitudinally) to jobs high in task scope. The nature of the relationship between task scope and satisfaction appears to be the same for all individuals, and when people do respond differentially, they do so in ways which we have not been able to predict. Thus, there is no justification for choosing employees to be recipients of job enrichment on the basis of some individual difference measure.

White's (1978) review of the research on individual difference moderators of the job scope-employee response relationships also asserted that researchers had failed to document any reliable moderator effects. In summarizing the many moderator studies, he concluded that: (1) often no moderating effects were found, (2) the effects of those moderators that did seem to exist were modest and inconsistent, (3) it appeared that the presence of many moderators was dependent on narrowly defined constructs and specific samples and situations, and (4) even when moderators did exist, their effects were in terms of the relative magnitude of the job scope-employee response

relationship rather than the direction of that relationship.

A Study on the Moderating
Effect of Growth Need
Strength by Pokorney,
Gilmore, and Beehr

Pokorney, Gilmore, and Beehr (1980) conducted research in part to determine whether individual growth strength moderated the relationships between work redesign characteristics and job satisfaction measures in the same direction as indicated by JCM. They collected data from two groups of employees of a large insurance company located throughout the United States and Canada. One group (first level management) consisted of 102 male incumbents occupying relatively high managerial claims positions and responsible for supervising employees in claims evaluation and processing units. The other group (second level managers) consisted of 71 males who were responsible for supervising the first level managers. Similar to Ganster (1980), Pokorney, Gilmore, and Beehr (1980) used the two separate methods of subgroup analysis and stepwise multiple regression to determine the effect of the hypothesized moderator variable (growth need strength).

Subgroup analysis provided only moderate support for the hypothesized moderating effect of growth need strength on the relationship between job characteristics variables and satisfaction variables, while regression analysis provided partial, but even weaker support

concerning the moderating role of growth need strength. The two methods, however, produced different results. Only the relationship between general job satisfaction and the job characteristic of feedback was shown to be moderated by growth need strength by both statistical methods. Pokorney, Gilmore, and Beehr (1980) concluded that the results obtained from the subgroup analysis provided more support for the hypothesized moderating effect of growth need strength than did the results from the regression analysis. The fact that these two methods of moderator analysis produced inconsistent results raised two problems. First, this study could not unequivocally answer the question of whether growth need strength did or did not play a moderating role in the relationships between job characteristics and job satisfaction. Second, the opposing results of the two moderator analyses suggested that one of them might be an inappropriate method. Pokorney, Gilmore, and Beehr (1980) were able to conclude that one core job characteristic (feedback) did interact with the growth need strength of managers to predict satisfaction.

A Test of the Moderating
Effect of Growth Need
Strength on the Job
Performance-Job Satis-
faction Relationship

Abdel-Halim (1980) collected data from a sample of 123 nonsupervisory employees (mostly salespeople) in a large retail drug organization in the midwest to examine

the moderating effects of employee higher order need strength or growth need strength on the relationship between job performance and job satisfaction. The data were analyzed using both the subgroup analytical strategy and the moderated regression technique. This was done for two reasons: (1) to assure that the results obtained were not simply artifacts of the analytical method used, and (2) to allow for comparability of the results with previous research findings (which often used only one of the two analytical strategies).

The results of the study indicated that employees' growth need strengths did moderate the job performance-employee satisfaction relationship. Specifically, performance was positively related to both intrinsic and extrinsic sources of job satisfaction for employees with high growth need strength, while the relationship approached zero or became negative for those with low growth need strength. Abdel-Halim (1980) concluded that, when coupled with research findings on work redesign (Hackman and Oldham, 1976, 1980) the results produced important implications. They suggested that careful attention should be given to individual differences when dealing with work redesign and motivation. Specifically, individuals with strong growth need strength should be placed on relatively complex and challenging jobs, thus increasing the intrinsic motivation and job satisfaction of those individuals.

Although both studies used the same statistical

techniques (subgroup analysis and moderated regression), the findings reported by Abdel-Halim (1980) were supportive of the moderating effect of growth need strength on the task scope-employee response relationships, and those reported by Ganster (1980) offered no support for this moderator. Those differences in research findings produced opposite conclusions from the two authors concerning individual differences and work redesign.

Many studies examined the moderating effect of individual differences on the job characteristic-employee response relationship with mixed and inconclusive results. As Kiggundu (1981:506) emphasized, more studies must be accomplished "before accepting White's (1978) moratorium on this line of research."

Summary

A thorough review of the research literature concerning the Job Characteristics Model (JCM) generally provided support for the work redesign theory proposed by Hackman and Oldham (1976, 1980), but also identified some problems and ambiguities in the model. The relevant research literature generated a number of implications which should be reemphasized.

The relationship between the perceived amount of core job characteristics present in a job and the affective response of the employees was strongly supported by the literature. When the motivational properties of work were

improved through work redesign, employees generally responded with increased internal work motivation, general job satisfaction, and growth satisfaction. Affective and motivational responses were more strongly and consistently related to work redesign than were behavioral responses. The studies relating perceived job characteristics to employee performance produced contradictory and inconclusive results, while the studies examining relationships between employee perceptions of their jobs and withdrawal behaviors (absenteeism and turnover) were generally supportive of the JCM predictions.

Research evidence generally suggested that the job characteristics affected the outcomes through the mediating effect of the psychological states as specified by the model. There were, however, some studies which did not support the contention of Hackman and Oldham (1976, 1980) concerning the causal role of the critical psychological states. Some studies did not support the hypothesis that all three psychological states were necessary for the existence of internal work motivation and demonstrated that each of the psychological states held a different causal role status within the model. Also, some of the core job characteristics were shown to affect psychological states other than those specified in the model, indicating the links between the job characteristics and the psychological states were not as neat and clean as suggested by the JCM. Some studies also suggested that

the job characteristics were not independent (mostly uncorrelated with one another) as treated by the model. Even Hackman and Oldham (1980:96) recognized that "jobs that are high on one job characteristic are often high on others as well." Intercorrelations among the job characteristics often diffused their effects on the psychological states and compromised the appropriateness of the multiplicative formula for motivating potential score (MPS).

Research studies did not totally clarify how the objective properties of jobs related to peoples' perceptions of those properties. Hackman and Oldham (1980) did not differentiate between objective and perceived properties of tasks as they related to the motivational benefits of enriched work. They did, however, emphasize that the objective "motivating potential" of the job did not cause employees who worked on that job to be internally motivated, to perform well, or to experience job satisfaction, and they stressed that it was the employees' perceptions of the objective job that were causal of their reactions to it. This employee perception-response relationship was strongly supported by the research literature.

Finally, studies concerned with moderators produced mixed results. Only a few studies addressed contextual satisfaction as a moderator of the job characteristics-outcome relationships and these were generally supportive of the predictions set forth in the model. A large number

of studies examined the moderating effect of growth need strength, and, although many were supportive of the JCM, the results were inconclusive. Some studies did and others did not find the predicted moderating effect. Additionally, several other individual difference variables were proposed as alternatives to growth need strength in determining how people reacted to their work. Though recognizing that growth need strength was certainly an important characteristic, some researchers suggested that it might not hold for some workers in some organizations or settings. The findings strongly suggested that individual differences had a significant impact on the effectiveness of any work redesign effort, but how best to construe and measure those differences remained an open question.

In sum, while there was support in the research literature for the JCM, it would be inappropriate to conclude that the model provided a correct and complete picture of the motivational effects of job characteristics. Based on available evidence, Hackman and Oldham (1980:95) noted that "it is fair to say that the model probably is more right than wrong, but that it is surely inaccurate and incomplete in numerous specifics." They argued that the model would be best viewed as a guide for further research and as an aid in planning for changes in work systems.

Chapter 4

RESEARCH METHODS

This chapter presents the research hypotheses and the methodological procedures employed to test them. The discussion of the methodology includes the experimental design, the research environment, the participants in the research and their selection, the survey instrument, the procedures employed in the data collection and the change project, the statistical methods used to analyze the data, and some methodological assumptions and limitations.

The reported study was a six month field experiment which investigated the perceived amount of core job characteristics (skill variety, task identity, task significance, autonomy, and feedback from the job) and the perceived amount of critical psychological states (meaningfulness of the work, responsibility for the work, and knowledge of results of the work activities) reported by United States Marine guards prior to and following a work redesign project. The affective and behavioral responses of the guards to work redesign in terms of job satisfaction, internal work motivation, job performance, conduct, and absenteeism, and the moderating effects of individual growth need strength were also investigated. An important

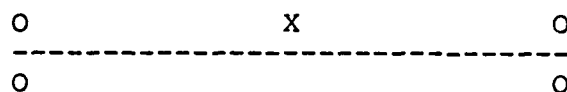
aspect of the research was the fact that the burden was not placed on management to identify the work problems, but instead included the workers in both job problem identification and job change suggestions.

Experimental Design

The design used in this study was a quasi-experimental design described by Campbell and Stanley (1966) as a nonequivalent control group design. This design

involves an experimental group and a control group both given a pretest and a posttest, but in which the control group and the experimental group do not have pre-experimental sampling equivalence. Rather, the groups constitute naturally assembled collectives such as classrooms, as similar as availability permits but yet not so similar that one can dispense with the pretest. The assignment of the experimental variable(s) to one group or the other is assumed to be random and under the experimenter's control (Campbell and Stanley, 1966:47).

This study compared a treated group with a control group in a situation where it was not feasible to assign individuals randomly to experimental and control groups. In such a situation, a reasonable comparison group, even though it was not randomly assigned, was better than no control group at all. Both the experimental and control groups were composed of intact work groups. The Job Diagnostic Survey (JDS) pretest was performed prior to the implementation of the experimental work changes and the JDS posttest was performed six months after the beginning of the change process. This design may be diagrammed as follows:



The X represents the exposure of a group to an experimental variable or event (the job change implementation), the effects of which are measured. The O refers to some process of observation or measurement (the JDS pretest and posttest). X's and O's in a given row are applied to the same specific persons. The left to right dimension indicates the temporal order. X's and O's vertical to one another are simultaneous. Parallel rows separated by a dashed line represent comparison groups not equated by random assignment (Campbell and Stanley, 1966).

The longitudinal study was conducted according to the following schedule:

Planning and Coordination Phase:	May 1 to June 30, 1981
Pretest and Data Collection:	July 1 to July 8, 1981
Diagnostic Phase:	July 9 to July 12, 1981
Management Seminars:	July 13 to July 15, 1981
Workshops:	July 16 to July 24, 1981
Job Change Implementation for Experimental Group:	August 1, 1981
Posttest and Data Collection:	February 1 to February 5, 1982
Evaluation:	February 6 to April 1, 1982

Research Hypotheses

The main hypothesis tested involved the relationship between work redesign, the core job dimensions, the critical psychological states, and organizational and personal outcomes. The author speculated that those individuals who had their job enriched (the experimental group) would react more positively to their job than those individuals who did not have their job enriched (the control group). The specific hypotheses were as follows:

Core Job Dimension Hypotheses

H1-1: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore perceive significantly more skill variety in their jobs than individuals in the control group.

H1-2: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore perceive significantly more task identity with their jobs than individuals in the control group.

H1-3: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore perceive significantly more task significance of their jobs than individuals in the control group.

H1-4: Individuals working in the enriched job

(experimental group) perceive their job as having been enriched and therefore perceive significantly more autonomy in their jobs than individuals in the control group.

H1-5: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore perceive significantly more feedback from the work itself than individuals in the control group.

H1-6: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore have a significantly higher Motivating Potential Score (MPS) than individuals in the control group.

H1-1 through H1-5 predicted that the average scores on the Job Diagnostic Survey (JDS) for the five core job dimensions, Skill Variety, Task Identity, Task Significance, Autonomy, and Feedback would be greater in the enriched (experimental) group than the average scores for the same dimensions in the control group. If these hypotheses were supported, it would indicate that the implementing principles, which were applied only in the enriched group, resulted in worker perceptions of a more enriched job than in the control group. H1-6 expressed the prediction that the average Motivating Potential Score (MPS) would be greater in the enriched group than in the control group. Support for H1-6 would lead to the same conclusion as in the case of the first five hypotheses; that the effort in

this study to apply the implementing principles in an ongoing complex military organization did lead to perceptions of an enriched job.

Critical Psychological
State Hypotheses

H1-7: Individuals working in the enriched job (experimental group) report significantly more experienced meaningfulness of the work than individuals working in the unenriched job (control group).

H1-8: Individuals working in the enriched job (experimental group) report significantly more experienced responsibility for the work than individuals working in the unenriched job (control group).

H1-9: Individuals working in the enriched job (experimental group) report significantly more knowledge of results of how effectively they are performing their jobs than individuals working in the unenriched job (control group).

H1-7, H1-8, and H1-9 predicted that the average scores for each psychological state, Experienced Meaningfulness, Experienced Responsibility, and Knowledge of Results, would be greater for workers in the enriched group than for workers in the control group. If H1-7 through H1-9 were supported by the data, this might suggest that the enriched job was related to the workers experiencing their work in ways thought to relate to motivation. Interpretation of nonsupport for these hypotheses

would depend partially on the core job dimensions hypotheses. Failure of any one of these first hypotheses would, according to the model, predict failure for the related psychological state hypothesis. For example, if workers in the enriched group did not perceive their work as providing them with more autonomy than did workers in the control group (failure of H1-4), it would follow from the model that the enriched group workers would not experience any greater sense of responsibility for their work (failure of H1-8). H1-7 through H1-9, then, clearly depended upon the success of H1-1 through H1-5.

Organizational and Personal
Outcome Hypotheses

H1-10: Individuals working in the enriched job (experimental group) report significantly more job satisfaction than individuals working in the unenriched job (control group).

H1-11: Individuals working in the enriched job (experimental group) report significantly more internal work motivation than individuals working in the unenriched job (control group).

H1-12: Individuals working in the enriched job (experimental group) are rated significantly better in their job performance than individuals working in the unenriched job (control group).

H1-13: Individuals working in the enriched job (experimental group) are rated significantly better in

their conduct than individuals working in the unenriched job (control group).

H1-14: Individuals working in the enriched job (experimental group) have significantly fewer occasions of absenteeism than individuals working in the unenriched job (control group).

H1-10 and H1-11 predicted that the affective responses to the job, General Satisfaction and Internal Work Motivation, would be greater for the enriched group than for the control group. These were certainly two of the most important hypotheses. The intent of the JCM and this study was to consider the variables which predicted motivation, job satisfaction, and performance. H1-12 and H1-13 predicted the performance and conduct outcomes. Other than the measure of absenteeism, these were the only variables not measured by worker perception. Support for these hypotheses would suggest a relationship between enriched work and performance and conduct as measured by others, a relationship generally not supported by past research (Pierce and Dunham, 1976), but one of concern to organizations of all kinds. H1-14 predicted that the number of occasions individuals were absent from work would be less for the enriched group than for the control group.

The second hypothesis tested dealt with the moderating effect of the individual difference characteristic, growth need strength. Hackman and Oldham (1980)

described growth need strength as the strength of an individual's desire to obtain growth satisfaction from his or her work. It was viewed as a malleable personality characteristic that determined how an individual would react to an enriched job. The specific growth need strength hypotheses were as follows:

Growth Need Strength
Hypotheses

H2-1: Individuals with high growth need strength in the experimental group report significantly more experienced meaningfulness of their enriched job than individuals with low growth need strength.

H2-2: Individuals with high growth need strength in the experimental group report significantly more experienced responsibility for their enriched job than individuals with low growth need strength.

H2-3: Individuals with high growth need strength in the experimental group report significantly more knowledge of results of how effectively they are performing their enriched job than individuals with low growth need strength.

H2-4: Individuals with high growth need strength in the experimental group report significantly more satisfaction with their enriched job than individuals with low growth need strength.

H2-5: Individuals with high growth need strength in the experimental group report significantly more

internal work motivation as a result of their enriched job than individuals with low growth need strength.

H2-6: Individuals with high growth need strength in the experimental group report significantly more satisfaction with supervision than individuals with low growth need strength.

The last six hypotheses, H2-1 through H2-6, predicted that persons in the enriched group whose growth need strength scores constituted the top quartile in the range of scores would have a higher average score for the following variables than would persons whose growth need strength scores constituted the bottom quartile: Experienced Meaningfulness, Experienced Responsibility, Knowledge of Results, General Satisfaction, Internal Work Motivation, and Supervisory Satisfaction. These hypotheses relied on the notion of the existence of an individual moderating variable between work redesign and employee response. If the individual characteristics summarized in the JCM as growth need strength moderated the work redesign-outcome relationship, the hypothesized differentials would appear.

Research Environment

To test the research hypotheses a longitudinal field experiment was conducted at a United States Naval Air Station and a United States Naval Base on the west coast. The commander of the area's Marine Barracks expressed a desire to participate in a work redesign

experiment, having perceived problems of absenteeism, motivation, and job satisfaction within his units. The specific organizations involved in the research were two Marine Detachments which were organized subunits of the Marine Barracks. The work units that were chosen from each of the Marine Detachments were sections A, B, and C (the entire detachment except for administrative personnel). These sections were on a three day work rotation schedule which included a 24 hour day of duty, followed by a day of training, followed by a day off.

The research focused on the job of the Marine security guard which was described as follows:

MOS 8151--Guard
Private through Gunnery Sergeant

Summary: Enforces, or supervises the enforcement of, security measures for protecting lives and property.
Duties and Tasks: Enforces military regulations and orders. Controls entrance to military posts, stations, or other establishments. Verifies authenticity of passes and identification cards of military personnel, civilian employees, and visitors afoot or in motor vehicles, entering or leaving installation. Prevents unauthorized removal of government property. Makes periodic check of standing lights and locked doors. Receives and verifies guard property. Maintains guard property account and guard report log book. Prepares offense, accident, unusual incident and injury reports, and correspondence pertaining to activities of a guard unit. Assures that scheduled bugle calls are sounded. May instruct guard in special and general orders, interior guard duty, and use of small arms. May inspect sentinels on post. May supervise or assist in supervising guard of the day during emergencies, such as fires. May direct traffic. May escort visitors, or vehicles delivering supplies and equipment (Marine Corps Order Pl200.7C, 1979: III-395).

Subject Selection

The sample subjects were selected for this experiment by virtue of their military assignment to their particular work units. Assignment to the work units was somewhat random in that as a vacancy occurred, due to unit attrition, reassignment, or promotion, it was filled by the next available qualified individual in the normal Marine Corps assignment pipeline. The reported work groups were chosen for the experiment because of their similarity to each other and the similarity of the work they performed.

A total of 78 security guards participated in the study. All of the participants were male and enlisted members of the United States Marine Corps. The distribution of the subjects in the experimental and control groups according to age, ethnic origin, education, and military rank is shown in Tables 1, 2, 3, and 4.

Instrumentation

One of the primary reasons for the void in the empirical and theoretical knowledge of work redesign was the limited ability to accurately measure what happened when jobs were redesigned (Rosenbach, 1977). Hackman and Oldham (1974, 1975, 1980) made a great contribution to empirical work redesign research with the development of the Job Diagnostic Survey (JDS). Data for the

Table 1
Age Distribution by Group

Age	Experimental Group		Control Group		Total	
	Number	%	Number	%	Number	%
Under 20	0	0	3	7.7	3	3.85
20 to 24	36	92.3	36	92.3	72	92.30
25 to 29	3	7.7	0	0	3	3.85
Total	39		39		78	

Table 2
Ethnic Distribution by Group

Ethnic Origin	Experimental Group		Control Group		Total	
	Number	%	Number	%	Number	%
White	27	69.2	24	61.5	51	65.4
Black	3	7.7	6	15.4	9	11.5
Asian	3	7.7	0	0	3	3.8
American Indian	3	7.7	3	7.7	6	7.7
Hispanic	3	7.7	6	15.4	9	11.5
Total	39		39		78	

Table 3
Education Distribution by Group

Education	Experimental Group		Control Group		Total	
	Number	%	Number	%	Number	%
Some High School	6	15.4	24	61.5	30	38.5
High School Graduate	24	61.5	9	23.1	33	42.3
Some College	9	23.1	6	15.4	15	19.2
College Graduate	0	0	0	0	0	0
Total	39		39		78	

Table 4
Military Rank Distribution by Group

Military Rank	Experimental Group		Control Group		Total	
	Number	%	Number	%	Number	%
Private	0	0	0	0	0	0
Private First Class	9	23.1	0	0	9	11.5
Lance Corporal	21	53.8	30	76.9	51	65.4
Corporal	6	15.4	6	15.4	12	15.4
Sergeant	3	7.7	3	7.7	6	7.7
Total	39		39		78	

development of the questionnaire were obtained from over 1,500 individuals working on more than 100 jobs in 15 organizations. The instrument was designed to be of use both in the diagnosis of jobs prior to their redesign, and in research and evaluation efforts designed to assess the effects of redesigned jobs. The JDS measured four variables: job dimensions, critical psychological states, affective responses to the job, and individual growth need strength. The following is a description of the specific measures obtained from the JDS:

Job Dimensions

Job dimensions: objective characteristics of the job itself. The JDS provided measures of five core job dimensions defined as follows:

Skill Variety: The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the employee.

Task Identity: The degree to which the job requires the completion of a "whole" and identifiable piece of work--i.e., doing a job from beginning to end with a visible outcome.

Task Significance: The degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate work organization or in the external environment.

Autonomy: The degree to which the job provides substantial freedom, independence and discretion to the employee in scheduling his work and in determining the procedures to be used in carrying it out.

Feedback from the Job Itself: The degree to which carrying out the work activities required by the job results in the employee obtaining clear and direct information about the effectiveness of his or her performance (Hackman and Oldham, 1980:78-80).

In addition, measures were obtained from two

supplementary dimensions which were found to be helpful in understanding jobs and employee reactions to them.

Feedback from Agents: The degree to which the employee receives information about his or her performance effectiveness from supervisors or from co-workers. This dimension is not, in a strict sense, a characteristic of the job itself; but it is included to provide information to supplement that provided by the "feedback from the job itself" dimension.

Dealing with others: The degree to which the job requires the employee to work closely with other people in performing his or her job. It includes dealings with other organizational members and with external organizational clients (Hackman and Oldham, 1980:78-80).

Scores on the job dimensions were obtained from items in the first two sections of the instrument. One item in section One and two in section Two related to each job dimension. The question format within each section was the same for all dimensions. In the first section, respondents indicated directly on a seven-point response scale the amount of each job characteristic they perceived to be present in their job. For example, Task Significance was addressed by the following question:

5. In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

1-----2-----3-----4-----5-----6-----7

Not very significant: the outcomes of my work are <u>not</u> likely to have important effects on other people.	Moderately Significant.	Highly significant: the outcome of my work can affect other people in very important ways.
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In section Two, respondents indicated the accuracy of a number of statements about the characteristics of their

job. Each dimension was approached from both a positive and negative viewpoint. For the negative statements, reversed scoring was utilized, whereby the respondent's score was subtracted from 8. The respondents were asked to assess the accuracy of various statements using the following scale:

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

The questions which addressed Task Significance were:

8. This job is one where a lot of other people can be affected by how well the work gets done.
14. The job itself is not very significant or important in the broader scheme of things.

The scores on these three questions were averaged to obtain the respondents' Task Significance score. A similar set of three questions can be found in sections One and Two of the questionnaire for each job dimension.

Based on the scores from the five core job dimensions, Hackman and Oldham (1980) hypothesized a multiplicative summary score, the Motivating Potential Score (MPS) which measured the overall motivating potential of a job. The formula (Figure 4) reflected the JCM, for it represented the different relationships of the first three core job dimensions and the latter two with the critical psychological states and outcomes. Following the model, a job high in motivating potential would be high on at least one

of the three dimensions leading to Experienced Meaningfulness (Skill Variety, Task Identity, or Task Significance), and high on both Autonomy and Feedback as well. Following the formula, a near-zero score on either Autonomy, or Feedback would reduce the overall MPS significantly, while a near-zero score on one of the first three dimensions would not by itself have this effect.

Critical Psychological States

Critical psychological states: the psychological impact of the job on the employees. The JDS provided measures of the three critical psychological states which were viewed as mediating between objective job characteristics and the affective and behavioral responses of employees to their work (Hackman and Oldham, 1980). The critical psychological states were defined as follows:

1. Experienced meaningfulness of the work: The degree to which the employee experiences his or her job as one which is generally meaningful, valuable, and worthwhile.
2. Experienced responsibility for the work: The degree to which the employee feels accountable and responsible for the results of the work he or she does.
3. Knowledge of results: The degree to which the employee knows and understands, on a continuous basis, how effectively he or she is performing the job (Hackman and Oldham, 1980).

Scores for the critical psychological states were obtained both directly from self-descriptive items and indirectly from projective type items. In the self-descriptive section, respondents indicated their level of agreement with a number of statements about their work experiences using the following scale:

1	2	3	4	5	6	7
Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly

Questions dealing with Experienced Responsibility included:

8. I feel a very high degree of personal responsibility for the work I do on this job.
15. Whether or not this job gets done right is clearly my responsibility.

In the projective section, respondents were asked to "think of people in your organization who hold the same job as you do" and report how accurate they believed a number of statements were in describing the feelings of those people, using the same seven-point scale of agreement/disagreement. Questions measuring Experienced Responsibility were:

4. Most people on this job feel a great deal of personal responsibility for the work they do.
7. Most people on this job feel that whether or not the job gets done right is clearly their own responsibility.

Affective Responses to the Job

Affective responses to the job: The private,

affective reactions or feelings an employee gets from working on his job (Hackman and Oldham, 1980). The JDS provided measures of the following affective responses:

1. General Satisfaction: An overall measure of the degree to which the employee is satisfied and happy with his or her work. Hackman and Oldham (1974) stated that this measure was shown to predict both turnover and absenteeism.

2. Internal Work Motivation: The degree to which the employee is self-motivated to perform effectively on the job.

3. Specific Satisfaction: A number of short scales provided separate measures of satisfaction with: (a) job security, (b) pay and other compensation, (c) peers and co-workers ("social" satisfaction), (d) supervision, and (e) opportunity for personal growth and development on the job ("growth" satisfaction).

Items measuring general satisfaction and internal work motivation were intermixed with items tapping the three critical psychological states, in both the self-descriptive and projective sections of the instrument. Questions measuring Internal Work Motivation in the self-descriptive section included:

2. My opinion of myself goes up when I do this job well.

10. I feel bad and unhappy when I discover that I have performed poorly on this job.

An item measuring General Satisfaction in the projective

section was:

2. Most people on this job are very satisfied with the job.

For the five specific satisfactions, respondents reported directly how satisfied or dissatisfied they were with various aspects of their jobs using the following scale:

1	2	3	4	5	6	7
Extremely Dissatis- fied	Dissatis- fied	Slightly Dissatis- fied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied

The following five items measured pay, security, social, supervisory, and growth satisfactions respectively:

- How satisfied are you with this aspect of your job?
2. The amount of pay and fringe benefits I receive.
 1. The amount of job security I have.
 4. The people I talk to and work with on my job.
 5. The degree of respect and fair treatment I receive from my boss.
 6. The feeling of worthwhile accomplishment I get from doing my job.

Individual Growth Need Strength

The JDS measured the strength of an employee's desire to obtain "growth" satisfaction from his work. This measure was viewed as an individual difference characteristic which acted as a moderator or predictor of how positively employees would respond to a job with high motivating potential (Hackman and Oldham, 1975). Two separate measures of growth need strength were

obtained, one from items in the "Would Like" format, and one from items in a "Job Choice" format. In the "Would Like" section of the instrument, respondents were asked to indicate directly how much they would like to have a number of specified conditions present in their jobs, some of which focused on growth-relevant aspects of the work. The following seven-point scale was used.

4	5	6	7	8	9	10
Would like having this only a moderate amount (or less)			Would like having this very much		Would like having this <u>extremely</u> much	

The scale was numbered 4 to 7 to emphasize the fact that the scale of responses included only positive choices. In scoring these items a constant 3.0 was subtracted from each, thus reconverting them to the standard derived from the 1 to 7 scale. Individual Growth Need Strength items in this section included:

3. Chances to exercise independent thought and action in my job.
8. Opportunities to be creative and imaginative in my work.
10. Opportunities for personal growth and development in my job.

In the "Job Choice" section of the instrument, respondents indicated their relative preference for pairs of hypothetical jobs. In each item a job with characteristics relevant to growth need satisfaction was paired with a job which had the potential for satisfying one of a variety of other needs. The following are examples of

items from this section:

<u>Job A</u>			<u>Job B</u>		
1. A job where the pay is very good			A job where there is considerable opportunity to be creative and innovative		
1-----	2-----	3-----	4-----	5-----	
Strongly	Slightly	Neutral	Slightly	Strongly	
Prefer A	Prefer A		Prefer B	Prefer B	
5. A very routine job			A job where your co-workers are not very friendly		
1-----	2-----	3-----	4-----	5-----	
Strongly	Slightly	Neutral	Slightly	Strongly	
Prefer A	Prefer A		Prefer B	Prefer B	

The JDS was grounded in a conceptually sound psychological theory of what motivated people in their work. The instrument was tied specifically to the Job Characteristics Model (JCM) and provided measures of all the critical variables of the theory as well as measures of supplementary variables. Pierce and Dunham (1976) and Steers and Mowday (1977) stated that the JDS was the most detailed and most complete instrument for measuring task characteristics. The JDS, therefore, was a reliable and valid instrument for examining the characteristics of jobs and employee reactions to those jobs. The reliability and validity of the JDS was addressed in detail by Hackman and Oldham (1974, 1975). Table 5 describes the internal consistency reliabilities and median off-diagonal correlation of the JDS.

Table 5 is based on the data obtained from 658

Table 5

Reliabilities of the Job Diagnostic Survey (JDS)

Variable	Number of Items Measuring Each Variable	Internal Consistency Reliability	Median Off-Diagonal Correlation
Job Dimensions			
Skill Variety	3	.51	.19
Task Identity	3	.59	.12
Task Significance	3	.66	.14
Autonomy	3	.66	.19
Feedback from Job	3	.71	.19
Feedback from Agents	3	.78	.15
Dealing with Others	3	.59	.15
Psychological States			
Experienced Meaningfulness of the Work	4	.74	.26
Experienced Responsibility for the Work	6	.72	.23
Knowledge of Results	4	.76	.17
Affective Responses to the Job			
General Satisfaction	5	.76	.25
Internal Work Motivation	6	.76	.25
Specific Satisfaction			
Job Security ^a	2		
Pay ^a	2		
Social	3	.56	.23
Supervisory	3	.79	.25
Growth	4	.84	.28
Growth Need Strength			
"Would Like" Format ^b	6	.88	
"Job Choice" Format ^b	12	.71	

^aThese items were added to the JDS after the original data were collected; no reliability data are yet available.

^bOff-diagonal correlations are not reported for these two scales, since all items were designed to tap the same construct.

Source: J. R. Hackman and G. R. Oldham, "Development of the Job Diagnostic Survey," Journal of Applied Psychology, LX, No. 2 (1975), p. 164.

employees working on 62 different jobs in seven organizations. The jobs were highly heterogeneous, including blue-collar, white-collar, and professional work (Hackman and Oldham, 1975). The median off-diagonal correlation was the median correlation of the items scored on a given scale with all of the items scored on different scales of the same type of variable. Thus, the median off-diagonal correlation for skill variety (.19) was the median correlation of all items measuring skill variety with all the items measuring the other job dimensions. These median correlations provided one indication of the discriminant validity of the items.

Internal consistency reliabilities ranged from a high of .88 (growth need strength in the "Would Like" format) to a low of .56 (social satisfaction). The median off-diagonal correlations ranged from .12 (task identity) to .28 (growth satisfaction). In general, the results suggested that both the internal consistency reliability of the scales and the discriminant validity of the items were encouraging. In addition, Hackman and Oldham (1975:169) stated:

In developing the JDS, the intent was to develop scales composed of items with rather heterogeneous content--to maximize the substantive "richness" of each measure. This was accomplished at some cost to internal consistency reliability. The reliabilities are more than satisfactory when the instrument is used to obtain average scores of a group of five or more individuals who work on a given job. In such circumstances, the estimated internal consistency of each JDS scale would exceed .85 for the average of the group of individuals who hold the job.

For data collected from a single individual, the reliabilities would be as shown in Table 5.

Procedures

The Diagnostic Phase

The Job Diagnostic Survey (JDS) and the Job Characteristics Model (JCM) properly used together provide a set of tools for diagnosing existing jobs and a map for translating the diagnostic results into specific action steps for change. Hackman et al. (1975) observed that when job enrichment or work redesign failed, it often failed because of inadequate diagnosis of the target job and employees' reactions to it.

The diagnosis phase of the study began with the pretest. The JDS was administered to the participants in small groups ranging from 12 to 15 at a time, in detachment meeting rooms, and in the presence of the researcher. The importance of accurate responses was stressed. Participants were assured that their individual responses would be held in confidence and were given the option of not participating. No one declined to complete the questionnaire. Workers and supervisors were interviewed at their workplace regarding their attitudes toward the extrinsic and intrinsic aspects of their job. The Marine guard's job itself was closely examined to determine if it had potential for enrichment.

The JDS data were then analyzed by means of a

one-way analysis of variance and Pearson's product moment correlations to determine if the job itself had a potential for enrichment and if the workers indicated a readiness for job change. Table 6 shows the descriptive statistics for the JDS pretest.

The JDS motivation and satisfaction scores demonstrated that problems were inherent in the job and the extremely low composite MPS showed that the job itself was the probable cause of the participants' motivational problems. Therefore, each of the five core job dimensions were examined to determine the specific strengths and weaknesses of the job as it was structured. Figure 8 profiles the Marine participants' mean scores of JDS variables and compares them with the mean scores of the 658 respondents from 62 jobs in seven organizations used by Hackman and Oldham (1975) to establish JDS reliability and validity data. This substantiated the researcher's opinion that the amount of core job dimensions perceived to be present in the Marine guard's job was indeed low, especially when compared to other jobs.

Although the mean scores for the core job dimensions were low, the scores for individual growth need strength were relatively high on both the "Would Like" measure ($\bar{X} = 5.41$) and the "Job Choice" measure ($\bar{X} = 3.24$ on a five-point scale) of the JDS. These measures were helpful in determining how ready workers were to have their jobs changed. Hackman et al. (1975) emphasized that an important

Table 6
Descriptive Statistics for JDS Pretest

JDS Variable	Mean Score	Standard Deviation
Job Dimensions		
Skill Variety	1.82	1.47
Task Identity	3.90	1.96
Task Significance	3.91	2.33
Autonomy	2.67	1.73
Feedback from Job	3.74	1.83
Feedback from Agents	3.50	1.96
Dealing with Others	5.15	2.00
Motivating Potential Score (MPS)	36.25	27.79
Psychological States		
Meaningfulness of the Work	2.48	1.78
Responsibility for the Work	4.04	2.53
Knowledge of Results	4.11	1.86
Affective Responses to the Job		
General Satisfaction	2.23	1.69
Internal Work Motivation	4.03	2.03
Specific Satisfaction		
Pay Satisfaction	2.87	1.72
Security Satisfaction	3.35	1.90
Social Satisfaction	4.12	1.75
Supervisory Satisfaction	2.95	1.85
Growth Satisfaction	2.73	1.75
Individual Growth Need Strength		
"Would Like" Format	5.41	1.90
"Job Choice" Format	3.24	1.26

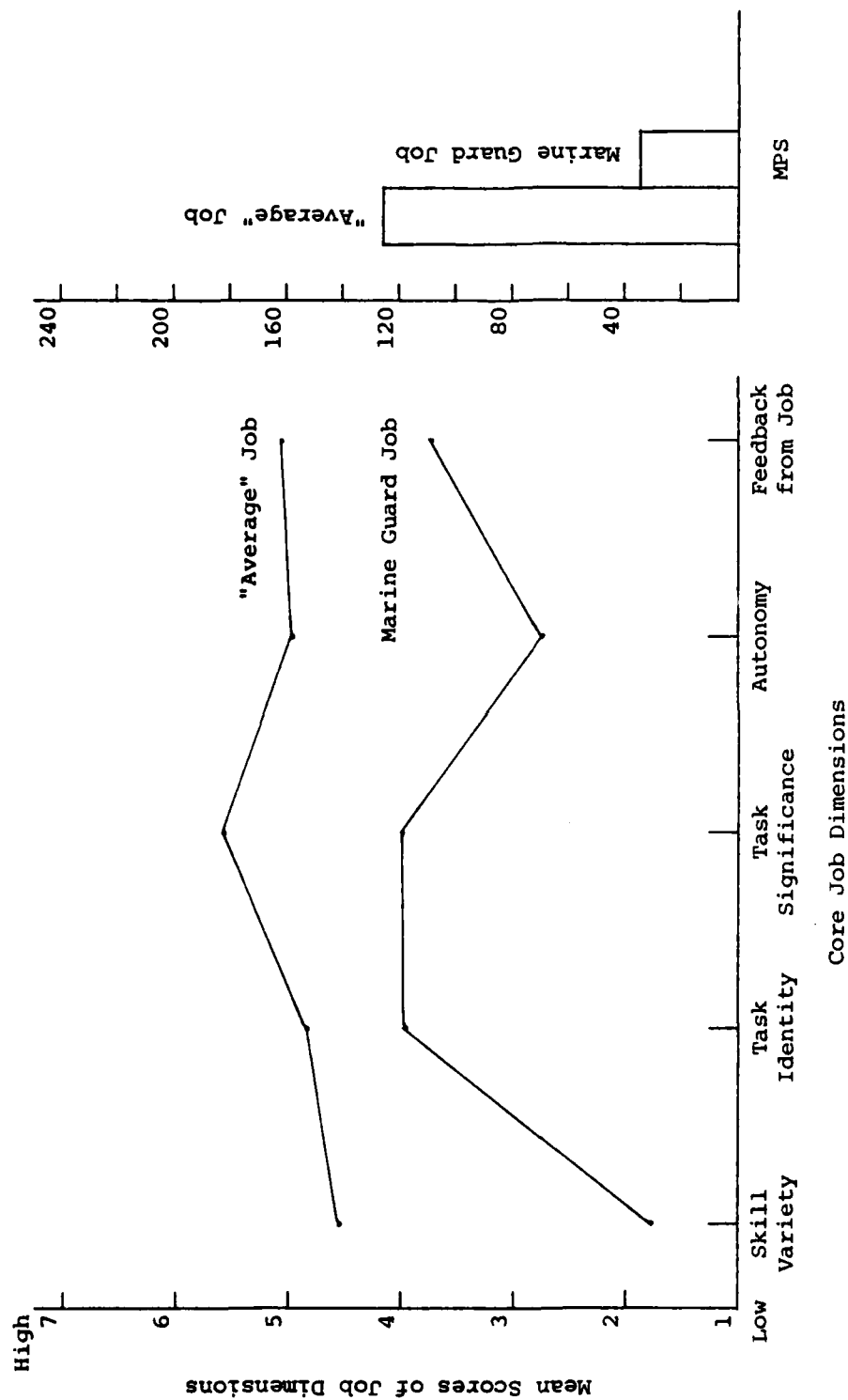


Figure 8. JDS Diagnostic Profile of Marine Guard Job Compared with "Average" Job

factor in job redesign planning was the level of growth needs of the employees, since employees high on growth needs usually responded more readily to job enrichment than did employees with little need for growth.

The results of the interviews and growth need strength measures demonstrated that the individuals in the Marine Detachments indicated a desire and readiness for enriched jobs. It was extremely obvious from the JDS data that the Marine guard's job had a great potential for enrichment. Analysis of the JDS data indicated that changes to the job should be made along all of the core job dimensions, with special emphasis on skill variety and autonomy (Figure 8).

At this point the work units that were to participate as the experimental group were identified. The pretest data indicated that there were no significant differences between the Marine guards stationed at the naval base and those stationed at the naval air station. It was decided that the three sections of Marine guards stationed at the naval air station would be the experimental group, while those stationed at the naval base would serve as the control group.

Management Seminar

A three-day management and orientation seminar was held for the middle and upper managers, including the Commander of the Marine Barracks and his staff, the

Detachment Commanders and their Guard Chiefs. This session took place in a location away from the Marine Detachments and possible work interruption. The format for the material covered at this seminar was structured and controlled but the atmosphere was informal in order to encourage a free exchange of views.

During the seminar the managers were familiarized with contemporary leadership and management styles and with motivation and job enrichment theory. The Job Characteristics Model (JCM) of work motivation theory was stressed, as was a practical examination of job enrichment implementation techniques and their problems. The managers were thoroughly briefed on all aspects of the planned project and their role in the project. The importance of their commitment to the project was emphasized. Risks and potential problems were identified, the expected organizational outcomes were discussed, and the managers were made aware that the project's success was not guaranteed. Questions and reservations regarding the project were solicited and answered to the satisfaction of all concerned. The commanders and their staff members were all extremely interested, enthusiastic, and supportive of the project's implementation.

Workshops

As was noted earlier, the workers themselves participated in determining what changes would be made

to their job. This was accomplished during workshops conducted for the experimental group's Marine guards and their section leaders. The first day of the workshop was devoted to an orientation of the project and a review of the major concepts and ideas of work motivation and job enrichment, with emphasis again placed on the JCM and its implementing concepts. The workers were then placed in small groups to identify job-related problem areas. Brainstorming sessions were held on the second day, and participants enthusiastically proposed ideas for solving the job-related problems and enriching their jobs. These sessions were conducted with each of the natural work units so that the workers and their own supervisors participated together. The workers were extremely enthusiastic and eager to participate. Over 400 proposals were generated during the brainstorming sessions. Many of the proposals were repetitive, but after careful screening by the researcher, 117 job change proposals were identified. An additional 28 change proposals suggested by the researcher brought the total number of specific suggestions to 145. The suggested changes made use of the implementing principles for job enrichment described by Hackman et al. (1975) and Hackman and Oldham (1980). These are shown in Figure 5.

Change Proposal Evaluation
and Job Change Implemen-
tation

A review and evaluation of the proposed job changes

followed the brainstorming sessions and workshop. Participants in this phase were the Detachment Commander, the Guard Chief, the three section leaders, and the researcher. Each item on the list of change proposals was examined carefully, and the advantage and disadvantage of each proposal as well as the means of implementation were thoroughly discussed. The impact of the proposed changes on the individual Marine Guards was also thoroughly considered. This group decided on 78 changes for implementation. Sixty-one of the changes were under the authority of the Detachment Commander to implement, while the remainder required approval by higher headquarters. Those were to be evaluated by higher headquarters for possible implementation at a later date. Forty-three of the 61 approved changes were initiated during the first month of the test period and an additional 11 were initiated during the second month. Because of long lead times, the remainder were implemented later.

Data Collection

Measures of all the variables used in this study, except for performance, conduct, and absenteeism, were collected using the JDS. These variables included the five core job characteristics of skill variety, task identity, task significance, autonomy, and feedback from the job. Following Hackman and Oldham (1975), these five characteristics were combined into a summary score, the

MPS, which reflected the overall potential of a job to prompt high internal work motivation and high quality performance. The critical psychological states of experienced meaningfulness of the work, experienced responsibility for the work, and knowledge of results, as well as the affective responses to the work such as general satisfaction, internal work motivation, and supervisory satisfaction were all measured by the JDS.

The measure of individual growth need strength (GNS) was obtained from the JDS in two formats. The "would like" format was measured on a seven-point scale, and the "job choice" format was measured on a five-point scale. Since the results of the two measures of growth need strength were similar, only the results of the "would like" format were used in the posttest. This was done because the internal consistency reliability for the "would like" format was higher than that of the "job choice" format (Hackman and Oldham, 1975). Another reason for reporting the "would like" results was that this format was the basis for previously reported research concerning growth need strength (Rosenbach, 1977; Hackman, Pearce, and Wolfe, 1978). The growth need scores of the experimental group were rank ordered and then divided into quartiles. The top quartile was designated the high GNS group ($\bar{X} = 6.73$, $N = 10$) and the bottom quartile was designated the low GNS group ($\bar{X} = 4.27$, $N = 10$).

Absenteeism data were collected from Marine

Detachment records and measured the number of occasions individuals were absent two months prior to the pretest and two months prior to the posttest. Following Rosenbach (1977), occasions absent rather than days absent were used to discount the effect of single long periods of absence.

Performance of the Marine guards was difficult if not impossible to measure. Since the security of the base was not compromised and there were no critical incidents, some surrogate measure for determining the level of performance had to be employed. It was decided to use overall performance evaluations of each Marine guard by his Detachment Commander. Each Marine was rated on duty proficiency (performance) on a scale ranging from zero (unsatisfactory) to five (outstanding). The marks indicated how well each Marine performed his primary job during the marking period. In addition to technical skills and specialized knowledge, qualities such as leadership and physical fitness were considered as they had a definite relation to the primary duty assignment. Prior to assigning the proficiency marks, the commander consulted with the immediate supervisor of each Marine guard. The following standards were used as guides in assigning the duty proficiency (performance) marks:

MARK	CORRESPONDING ADJECTIVE RATING	STANDARDS OF PERFORMANCE
0 to 1.9	Unsatisfactory	Does unacceptable work in most of his/her duties, generally undependable; needs considerable assistance

and close supervision on even the simplest assignment.

2 to 2.9	Poor	Does acceptable work in some of his/her duties but cannot be depended upon. Needs assistance and close supervision on all but the simplest assignments.
3 to 3.9	Fair	Handles routine matters acceptably but needs close supervision when performing duties not of a routine nature.
4 to 4.4	Good	Can be depended upon to discharge regular duties thoroughly and competently but usually needs assistance in dealing with problems not of routine nature.
4.5 to 4.8	Excellent	Does excellent work in all regular duties, but needs assistance in dealing with extremely difficult or unusual assignments.
4.9 to 5	Outstanding	Does superior work in all of his/her duties. Even extremely difficult or unusual assignments can be given to him/her with full confidence that they will be handled in a thoroughly competent manner (Marine Corps Order P1070.12, 1977:IV-36).

The conduct of the guards was also assessed using overall evaluations of each Marine by his Detachment Commander. As with the performance evaluations, each Marine was rated on conduct on a scale ranging from zero (unsatisfactory) to five (outstanding). The marks provided an evaluation of each Marine's conduct for the marking period. Conduct included observance of the law and regulations, conformance to custom, and positive contributions to the unit and Marine Corps. General bearing, attitude, interest, reliability, courtesy, cooperation, obedience,

adaptability, influence on others, moral fitness, physical fitness, and participation in unit activities not related directly to unit mission were all factors of conduct considered in evaluating each Marine. The following standards were used as guides in assigning conduct marks:

MARK	CORRESPONDING ADJECTIVE RATING	STANDARDS OF CONDUCT
0 to 1.9	Unsatisfactory	Habitual offender, or conviction by general, special or more than one summary court-martial. A mark of "Ø" shall be given upon declaration of desertion and for any period of confinement in a designated place of confinement pursuant to sentence of a general court-martial.
2 to 2.9	Poor	No special court-martial; not more than one summary court-martial, or not more than two nonjudicial punishments nor a reduction in grade.
3 to 3.9	Fair	No court-martial and not more than one nonjudicial punishment that does not result in a reduction in grade. No unfavorable impressions of the qualities listed. Conduct such as not to impair appreciably his/her own usefulness or the efficiency of the command but conduct not sufficient to merit an honorable discharge. Considered to meet minimum standards.
4 to 4.4	Good	No offenses. No unfavorable impressions as to attitude, interests, cooperation, obedience, after-effects of intemperance, courtesy and consideration, and observance of regulations.
4.5 to 4.8	Excellent	No offenses. Positive favorable impressions of the qualities listed in paragraph 4008.6a, above. Demonstrated reliability, good influence,

sobriety, obedience, and industry.

4.9 Outstanding to 5	No offenses. Exhibits to an outstanding degree the qualities listed. Observes spirit as well as letter of orders and regulations. Demonstrated positive effect on others by example and persuasion (Marine Corps Order P1070.12, 1977:IV-35).
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The performance and conduct evaluations were obtained from each of the Marine Detachments and data were selected so that two performance and conduct assessments were obtained for each Marine, one referring to the period before the job changes were made (the semi-annual rating period 1 February 1981 to 31 July 1981) and one for the period following the changes (1 August 1981 to 31 January 1982).

Treatment of the Data

A one-way analysis of variance (ANOVA) and Pearson's product moment correlations were employed for the analysis of the pretest data. These were used to determine if the job itself had a potential for enrichment and if the workers indicated a readiness for job change. The statistical methods used to test the study's hypotheses included t-tests and chi-square tests.

The JDS mean scores and the performance ratings were calculated for the control and experimental sections, and t-tests were performed for each item to determine if there were significant differences between the control and

experimental groups at the pretest, if there were significant changes in each group from the pretest to posttest, and if there were significant differences between the control and experimental groups at the posttest. This determined the effects of the implementation of the job changes. Computation of the means also allowed a comparison of these values to the JDS norm data (Hackman and Oldham, 1980). Chi-square tests were computed to compare the absenteeism and performance data between the experimental and control groups and to determine whether the differences were significant.

The hypotheses concerning growth need strength were also tested using t-tests. The top and bottom quartiles of GNS scores for the experimental group were calculated and t-tests were performed comparing high and low GNS pretest data, each group's pretest to posttest changes, and high and low GNS posttest data, to determine the moderating effect of growth need strength. Comparisons were made for the three critical psychological states, general job satisfaction, internal work motivation, and supervisory satisfaction for the high and low GNS groups.

Methodological Assumptions and Limitations

For the purposes of this study, various assumptions were made, and certain limitations resulting in some loss of control were recognized. It was assumed that the questionnaire was administered without prejudice or bias

by the researcher. Minimal oral and written instructions were utilized to prevent any possible effects of interactions with the subjects and the experimenter's own expectations regarding their performance. However, interactions can occur to some degree under those conditions.

Some restrictions on the generalizability and interpretability of the study should be recognized. The organization studied was a highly structured, hierarchical military organization, and the focal job was both low in the organizational hierarchy and in motivating potential (the mean MPS prior to the change was approximately three standard deviations below the national mean reported by Oldham, Hackman, and Stepina, 1979). All the workers were in the military and all were male, so one might question the generalizability of the results to female workers. The majority of the workers (92 percent) were between the ages of 20 and 25. About 61.5 percent of the workers were high school graduates and approximately 19 percent of them had some college experience.

There are some factors, however, which make a case for the generalizability of the results. Although all workers were in the military, 92 percent were first term Marines and could not be considered career military members. The growth need scores of the experimental group ($\bar{X} = 5.58$) were very close to the scores of the diverse population measured by Hackman and Oldham (1975) ($\bar{X} = 5.62$). Also,

these were real workers, working at their job in a real, ongoing organization. The JCM was developed on a large, extremely heterogeneous sample of individuals and jobs. This study focused on a homogeneous group of employees engaged in a simple job, and tested the applicability of the model to blue collar manual employees with fairly low levels of formal education. Whether the effects obtained in this study would have been obtained in a different kind of organization, or for jobs that were generally more motivating to begin with, is open to question.

It should also be noted that the primary measures of job characteristics used in this research were the perceptions of the employees themselves. Results might be biased if the data measured perceptions which did not accurately reflect the objective nature of the job being studied. Additional research on how perceptions of job characteristics are jointly affected by the objective characteristics of jobs and the social and personal environments of the workers is certainly necessary. The results concerning performance and conduct were also limited in that it was not possible to measure these variables directly, necessitating the use of a surrogate measure.

Perhaps the greatest limitation of the study was that no measurement of other potential moderating variables besides GNS was taken. The literature, the revised JCM in 1980, and logic suggested the probable existence of other types of variables such as skill, knowledge, and contextual

satisfactions. The major drawback in not attempting to measure some of these variables was the potential misinterpretation of the experiment's results. For example, if the model was not supported by the data or if the hypotheses were rejected due to unknown interference by moderating variables, a conclusion that the model did not apply to the highly structured military organization or that the experimental manipulations were not effective might be false.

Chapter 5

RESEARCH FINDINGS AND ANALYSES

The results of the data analyses for the experiment described in the preceding chapter are presented in this chapter. The presentation is organized into sections corresponding to the statement of the research hypotheses in Chapter 4. First, the relationships between work redesign and the core job characteristics, the critical psychological states, and organizational and personal outcomes are examined by presenting the results of the experiment as they relate to the first set of hypotheses. Next, the results of the investigation of the moderating effects of growth need strength are presented. Finally, a summary of the results is presented.

The Job Diagnostic Survey (JDS) mean scores and variances, the occasions of absenteeism, and the conduct and performance ratings were calculated for both the control and experimental groups, and t-tests and chi-square tests were computed to determine the effects of the work redesign experiment. Table 7 presents the pretest and posttest JDS descriptive statistics for the control group, and Table 8 presents the JDS descriptive statistics for the experimental group.

Table 7

Control Group Descriptive Statistics for
JDS Pretest and Posttest

JDS Variable	Pretest		Posttest	
	Mean Score	Standard Deviation	Mean Score	Standard Deviation
Job Dimensions				
Skill Variety	1.84	.97	1.78	.79
Task Identity	3.87	1.68	3.96	1.30
Task Significance	3.90	1.46	3.94	1.31
Autonomy	2.91	1.09	2.84	1.03
Feedback from Job	3.59	1.04	3.64	1.29
Feedback from Agents	3.31	1.92	3.58	1.64
Dealing with Others	5.13	1.38	5.29	1.15
Motivating Potential Score (MPS)	38.14	27.95	35.65	24.28
Psychological States				
Meaningfulness of the Work	2.79	1.39	2.49	1.22
Responsibility for the Work	4.48	1.58	4.57	.87
Knowledge of Results	4.27	1.14	4.02	1.19
Affective Responses to the Job				
General Satisfaction	2.43	1.31	2.09	.95
Internal Work Motivation	4.08	1.29	4.06	1.17
Specific Satisfaction				
Pay Satisfaction	2.85	1.51	3.62	1.35
Security Satisfaction	3.12	1.82	3.49	1.67
Social Satisfaction	3.77	1.41	4.31	1.13
Supervisory Satisfaction	2.92	1.81	3.22	1.76
Growth Satisfaction	2.65	1.61	2.69	1.35
Individual Growth Need Strength				
"Would Like" Format	4.96	1.32	5.61	1.23
"Job Choice" Format	3.20	.39	3.30	.63

Table 8
Experimental Group Descriptive Statistics
for JDS Pretest and Posttest

JDS Variable	Pretest		Posttest	
	Mean Score	Standard Deviation	Mean Score	Standard Deviation
Job Dimensions				
Skill Variety	1.79	.90	3.98	1.18
Task Identity	3.92	.91	4.86	1.11
Task Significance	3.99	1.46	5.52	.81
Autonomy	2.42	.91	4.94	1.10
Feedback from Job	3.97	1.03	4.72	.93
Feedback from Agents	3.69	1.35	4.87	1.11
Dealing with Others	5.33	1.00	6.39	.71
Motivating Potential Score (MPS)	33.43	22.61	118.17	59.81
Psychological States				
Meaningfulness of the Work	2.37	1.00	4.47	1.21
Responsibility for the Work	3.79	1.01	5.54	.68
Knowledge of Results	3.96	1.28	5.20	.77
Affective Responses to the Job				
General Satisfaction	1.97	.51	4.35	1.11
Internal Work Motivation	3.98	.93	5.57	.72
Specific Satisfaction				
Pay Satisfaction	3.77	1.05	4.92	1.03
Security Satisfaction	3.58	1.31	5.50	1.03
Social Satisfaction	4.44	.91	5.56	.84
Supervisory Satisfaction	3.08	1.59	5.37	1.15
Growth Satisfaction	2.90	1.23	5.08	1.12
Individual Growth Need Strength				
"Would Like" Format	5.82	1.19	5.58	.98
"Job Choice" Format	3.28	.70	3.53	.47

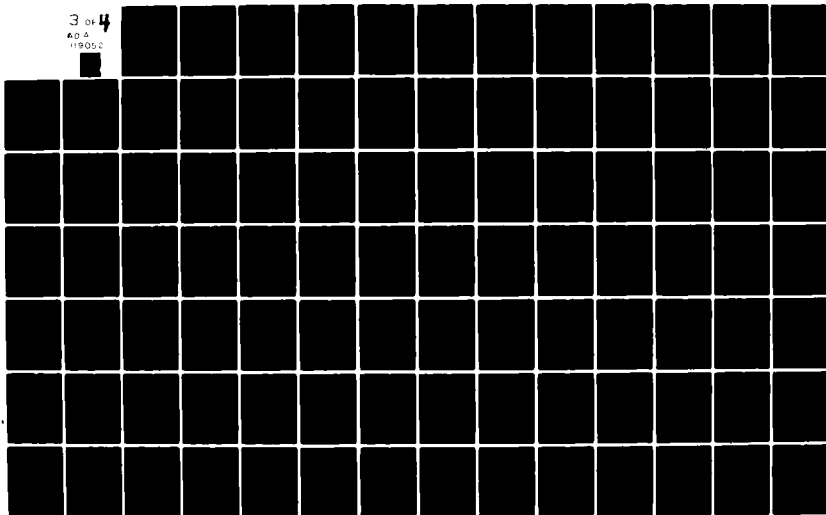
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Work Redesign and the Core
Job Characteristics

Work Redesign Leads to
Perceptions of Increased
Skill Variety

H1-1: Individuals working in the enriched job
(experimental group) perceive their job as having been
enriched and therefore perceive significantly more skill
variety in their jobs than individuals in the control group.

Hypothesis 1-1 received strong support from the data.

Figure 9 illustrates the JDS mean scores for skill variety for the experimental and control groups before and after the job changes. The t-test results shown in Table 9 demonstrated that there was no significant difference between the experimental and control groups at the pretest, whereas at the posttest the two groups were significantly different ($p < .001$). There was no significant change in the skill variety mean from the pretest to the posttest for the control group, but there was a significant increase in this value for the experimental group ($p < .001$). Work redesign did lead to the Marine guards' perceptions of increased skill variety in their jobs.

Work Redesign Leads to
Perceptions of Increased
Task Identity

H1-2: Individuals working in the enriched job
(experimental group) perceive their job as having been
enriched and therefore perceive significantly more task

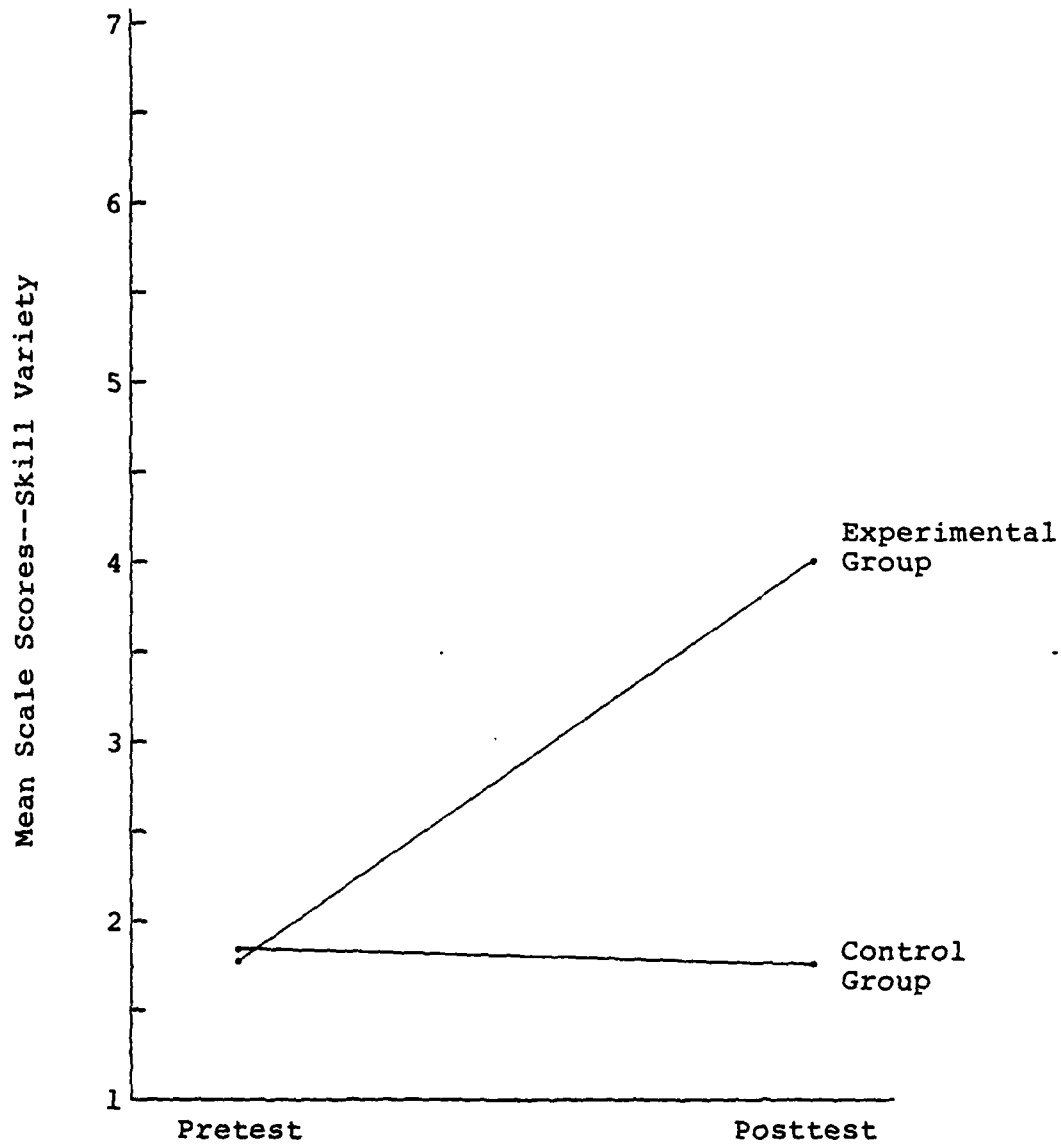


Figure 9. Comparison of Perceived Skill Variety in Control and Experimental Groups Before and After Work Redesign

Table 9

t-Tests for the Effects of the Job Change
Implementations on Worker Perceptions
of Skill Variety

Skill Variety				
	Mean	Variance	S.D.	<u>t</u> -Value
Pretest Comparison				
Experimental Group (N=39)	1.794	.802	.895	.2008 NS
Control Group (N=39)	1.837	.940	1.677	
Pretest to Posttest Changes				
Experimental Group				
Pretest	1.794	.802	.985	9.087 p<.001
Posttest	3.982	1.401	1.184	
Control Group				
Pretest	1.837	.940	.970	.293 NS
Posttest	1.773	.606	.779	
Posttest Comparison				
Experimental Group	3.982	1.401	1.184	8.799 p<.001
Control Group	1.788	.606	.799	

identity with their jobs than individuals in the control group. Hypothesis 1-2 was strongly supported by the data. Figure 10 shows the pretest and posttest JDS mean scores for task identity for the experimental and control groups. As shown in Table 10, the t-test results indicated that there was no significant difference in the pretest mean scores for the experimental and control groups. The mean score for the experimental group increased significantly from the pretest to the posttest ($p < .001$), while the control group showed no significant change. The mean score for the experimental group was significantly higher ($p < .001$) than that of the control group at the posttest. Work redesign did lead to increased perceptions of task identity.

Work Redesign Leads to
Perceptions of Increased
Task Significance

H1-3: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore perceive significantly more task significance of their jobs than individuals in the control group. Hypothesis 1-3 received strong support from the data. The JDS mean scores for task significance for the experimental and control groups before and after the job changes are shown in Figure 11. The t-test results shown in Table 11 indicated that while there was no significant difference between the two groups at the pretest, the

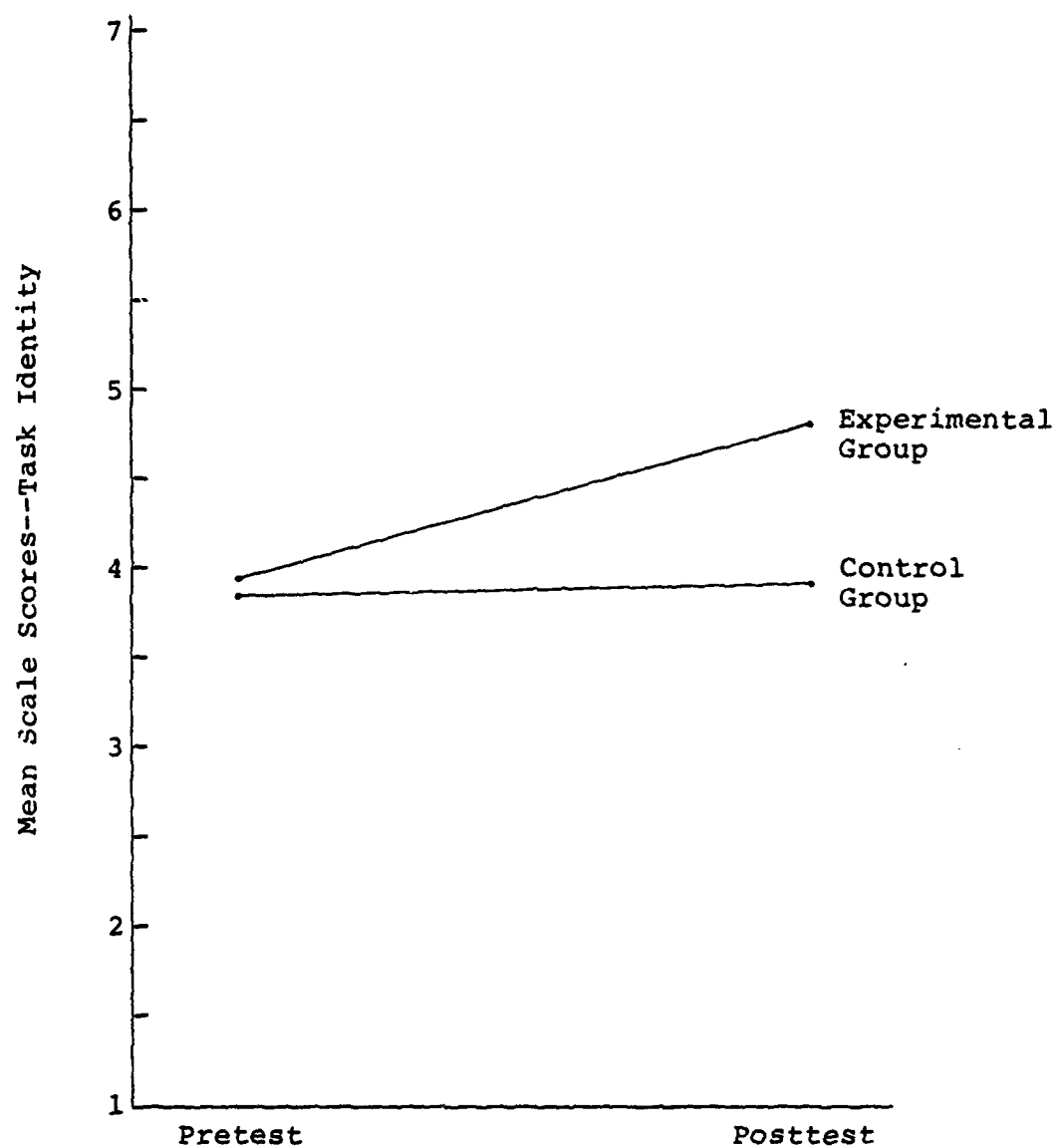


Figure 10. Comparison of Perceived Task Identity in Control and Experimental Groups Before and After Work Redesign

Table 10

t-Tests for the Effects of the Job Change
Implementations on Worker Perceptions
of Task Identity

		Task Identity				
		Mean	Variance	S.D.	<u>t</u> -Value	
<hr/>						
Pretest Comparison						
Experimental Group (N=39)		3.923	.823	.907	.165	NS
Control Group (N=39)		3.972	2.813	1.677		
Pretest to Posttest Changes						
Experimental Group						
Pretest		3.923	.823	.907	4.039	p<.001
Posttest		4.863	1.235	1.111		
Control Group						
Pretest		3.872	2.813	1.677	.247	NS
Posttest		3.957	1.700	1.304		
Posttest Comparison						
Experimental Group		4.863	1.235	1.111	3.260	p<.01
Control Group		3.957	1.700	1.304		

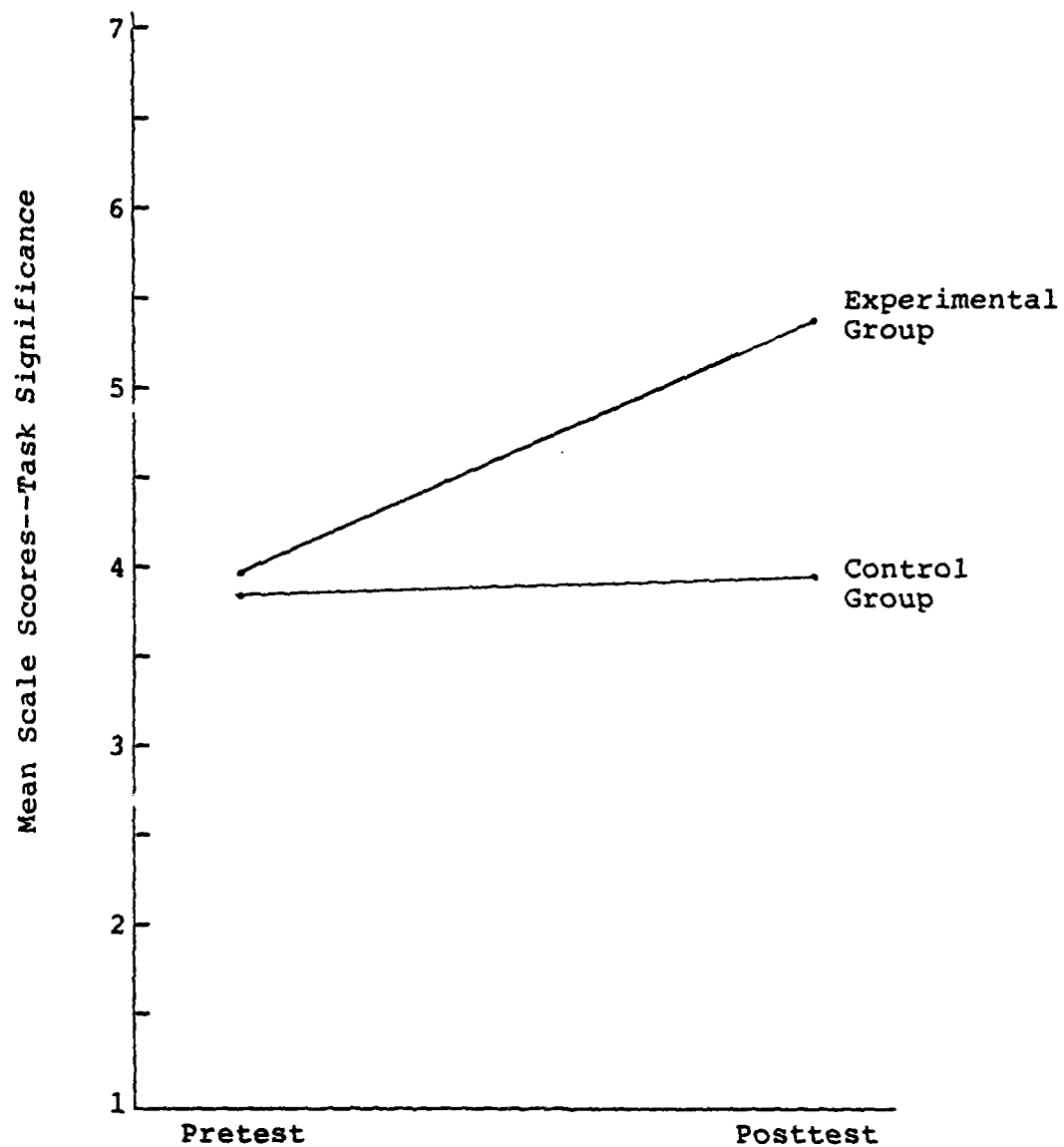


Figure 11. Comparison of Perceived Task Significance in Control and Experimental Groups Before and After Work Redesign

Table 11

t-Tests for the Effects of the Job Change
Implementations on Worker Perceptions
of Task Significance

Task Significance					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	3.992	2.118	1.455	.284	NS
Control Group (N=39)	3.897	2.120	1.456		
Pretest to Posttest Changes					
Experimental Group					
Pretest	3.992	2.118	1.455	5.654	p<.001
Posttest	5.521	.661	.813		
Control Group					
Pretest	3.897	2.120	1.456	.135	NS
Posttest	3.940	1.710	1.308		
Posttest Comparison					
Experimental Group	5.521	.661	.813	6.329	p<.001
Control Group	3.940	1.710	1.308		

experimental group's mean score was significantly higher ($p < .001$) than the control group's at the posttest. The control group showed no significant change from pretest to posttest, whereas the mean score for the experimental group increased significantly ($p < .001$). Working in enriched jobs did lead to increased worker perceptions of task significance.

Work Redesign Leads to
Perceptions of Increased
Autonomy

H1-4: Individuals working in the enriched job (experimental group) perceive their job as having been enriched and therefore perceive significantly more autonomy in their jobs than individuals in the control group. Hypothesis 1-4 was strongly supported by the research findings. Figure 12 illustrates the experimental and control groups' mean scores for autonomy on the JDS pretest and posttest, and Table 12 presents the t -test results on the effects of the work redesign project. The mean score for the experimental group was significantly lower ($p < .05$) than that of the control group on the pretest, whereas this situation was reversed on the posttest with the experimental group's score being significantly higher ($p < .001$) than that of the control group. The control group showed no significant change from the pretest to the posttest, but the experimental group's mean score increased significantly ($p < .001$). Work redesign positively

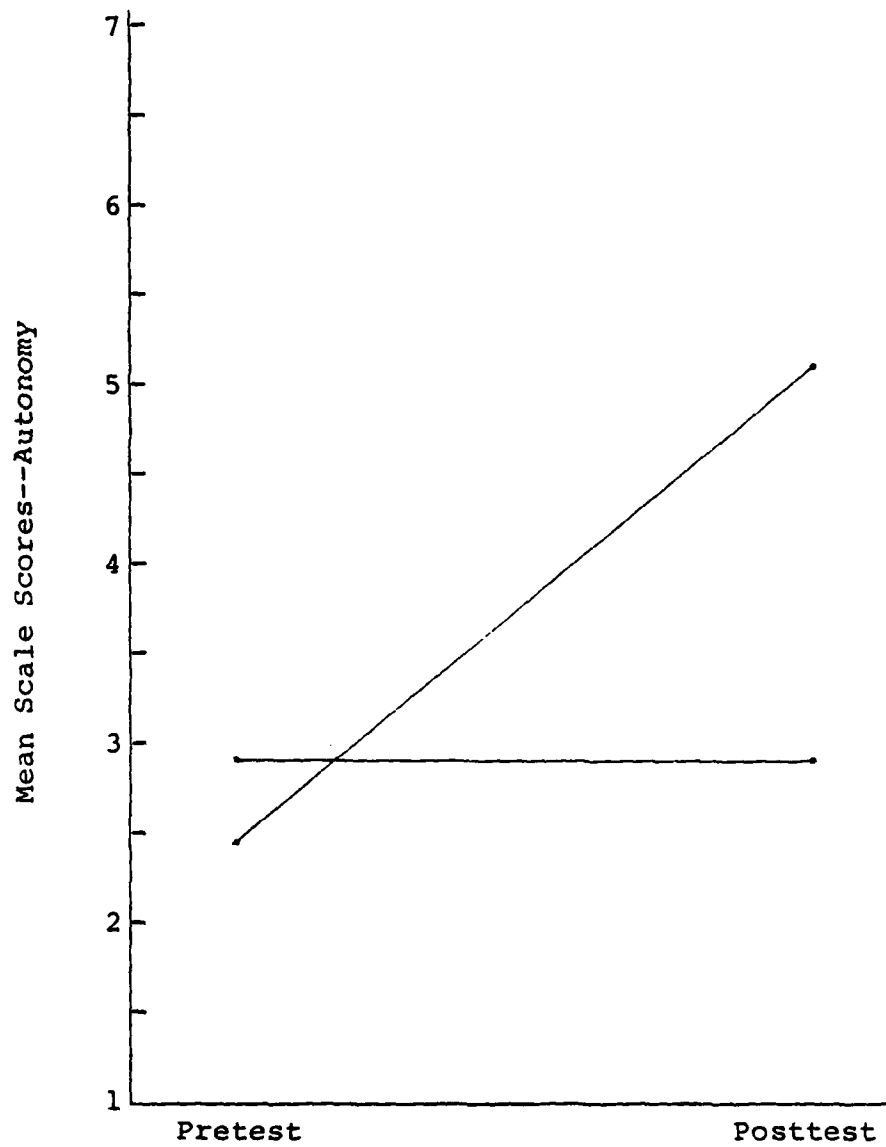


Figure 12. Comparison of Perceived Autonomy in Control and Experimental Groups Before and After Work Redesign

Table 12
t-Tests for the Effects of the Job Change
 Implementations on Worker Perceptions
 of Autonomy

		Autonomy			
	Mean	Variance	S.D.	t-Value	
Pretest Comparison					
Experimental Group (N=39)	2.419	.831	.912	2.149	p<.05
Control Group (N=39)	2.915	1.194	1.093		
Pretest to Posttest Changes					
Experimental Group					
Pretest	2.419	.831	.912	10.857	p<.001
Posttest	4.940	1.218	1.104		
Control Group					
Pretest	2.915	1.194	1.093	.312	NS
Posttest	2.839	1.065	1.032		
Posttest Comparison					
Experimental Group	4.940	1.218	1.104	8.572	p<.001
Control Group	2.839	1.065	1.032		

influenced the Marines' perceptions of the amount of autonomy present in their job.

Work Redesign Leads to
Perceptions of Increased
Feedback from the Job

H1-5: Individuals working in the enriched job
(experimental group) perceive their job as having been
enriched and therefore perceive significantly more feedback
from the work itself than individuals in the control group.

Hypothesis 1-5 received strong support from the data.

Figure 13 shows the experimental and control groups' pretest and posttest mean JDS scores for feedback from the job. The t-test results depicted in Table 13 indicated that there was no significant difference between the two groups at the pretest, but the mean score of the experimental group was significantly higher ($p < .001$) than that of the control group on the posttest. The pretest to posttest scores for the two groups showed a significant increase for the experimental group ($p < .01$) and no significant change for the control group. Enriched work did lead to increases in worker perceptions of feedback from their jobs.

Work Redesign Leads to
Perceptions of an
Enriched Job

H1-6: Individuals working in the enriched job
(experimental group) perceive their job as having been
enriched and therefore have a significantly higher

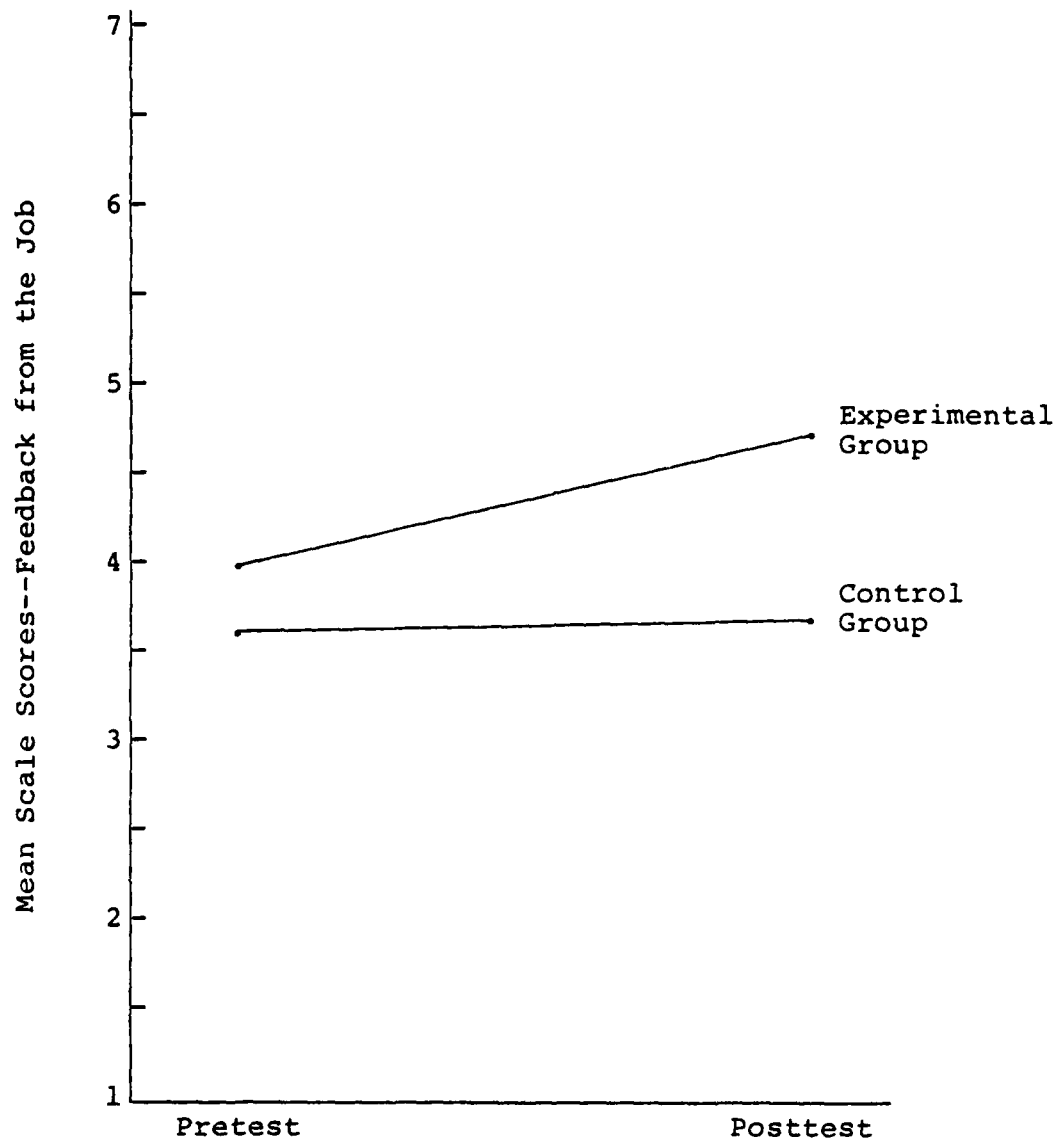


Figure 13. Comparison of Perceived Feedback from the Job in Control and Experimental Groups Before and After Work Redesign

Table 13

t-Tests for the Effects of the Job Change
Implementations on Worker Perceptions
of Feedback from the Job

Feedback from the Job					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	3.966	1.064	1.031	1.581	NS
Control Group (N=39)	3.590	1.086	1.042		
Pretest to Posttest Changes					
Experimental Group					
Pretest	3.966	1.064	1.031	3.326	p<.01
Posttest	4.717	.874	.935		
Control Group					
Pretest	3.590	1.086	1.042	.190	NS
Posttest	3.641	1.655	1.286		
Posttest Comparison					
Experimental Group	4.717	.874	.935	4.171	p<.001
Control Group	3.641	1.655	1.286		

Motivating Potential Score (MPS) than individuals in the control group. Hypothesis 1-6 was confirmed by the research findings. Figure 14 illustrates the MPS for the experimental and control groups before and after the job changes, and Table 14 depicts the t-test analyses of the differences of the mean scores for MPS. There was no significant difference between the two groups before the job changes, whereas the MPS mean score for the experimental group was significantly higher ($p < .001$) than the same score for the control group six months after the work was redesigned. The MPS mean score increased significantly ($p < .001$) from the pretest to the posttest for the experimental group, while the control group showed no significant change. The work redesign effort did lead to perceptions of an enriched job.

Hypotheses 1-1 through 1-6 predicted that the mean scores on the JDS posttest for the MPS, and the five core job characteristics of skill variety, task identity, task significance, autonomy, and feedback from the job would be greater in the experimental group than the mean scores for the same dimensions in the control group. The control and experimental groups' posttest comparison on these dimensions is shown in Figure 15. The strong support provided by the data for hypotheses 1-1 through 1-6 indicated that the JCM's implementing principles, applied only to the experimental group in an ongoing complex military organization, resulted in worker perceptions of a more

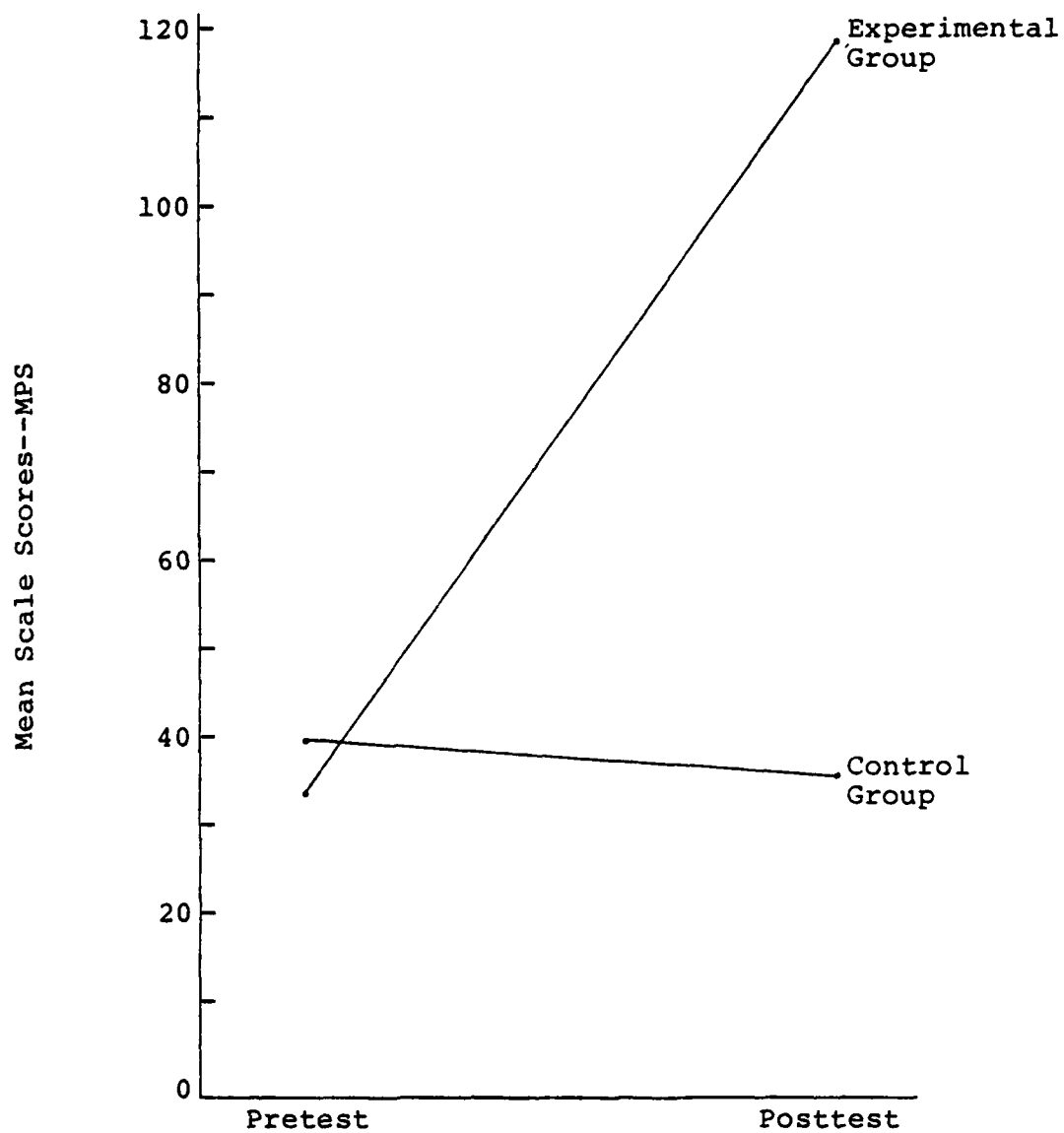


Figure 14. Comparison of Motivating Potential Score in Control and Experimental Groups Before and After Work Redesign

Table 14

t-Tests for the Effects of the Job Change
Implementations on the Motivating
Potential Score (MPS)

Motivating Potential Score (MPS)					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	33.434	511.339	22.613	.806	NS
Control Group (N=39)	38.136	781.015	27.947		
Pretest to Posttest Changes					
Experimental Group					
Pretest	33.434	511.339	22.613	8.170	p<.001
Posttest	118.171	3576.805	59.806		
Control Group					
Pretest	38.136	781.015	27.947	.413	NS
Posttest	35.655	589.583	24.281		
Posttest Comparison					
Experimental Group	118.171	3576.805	59.806	7.880	p<.001
Control Group	35.655	589.583	24.281		

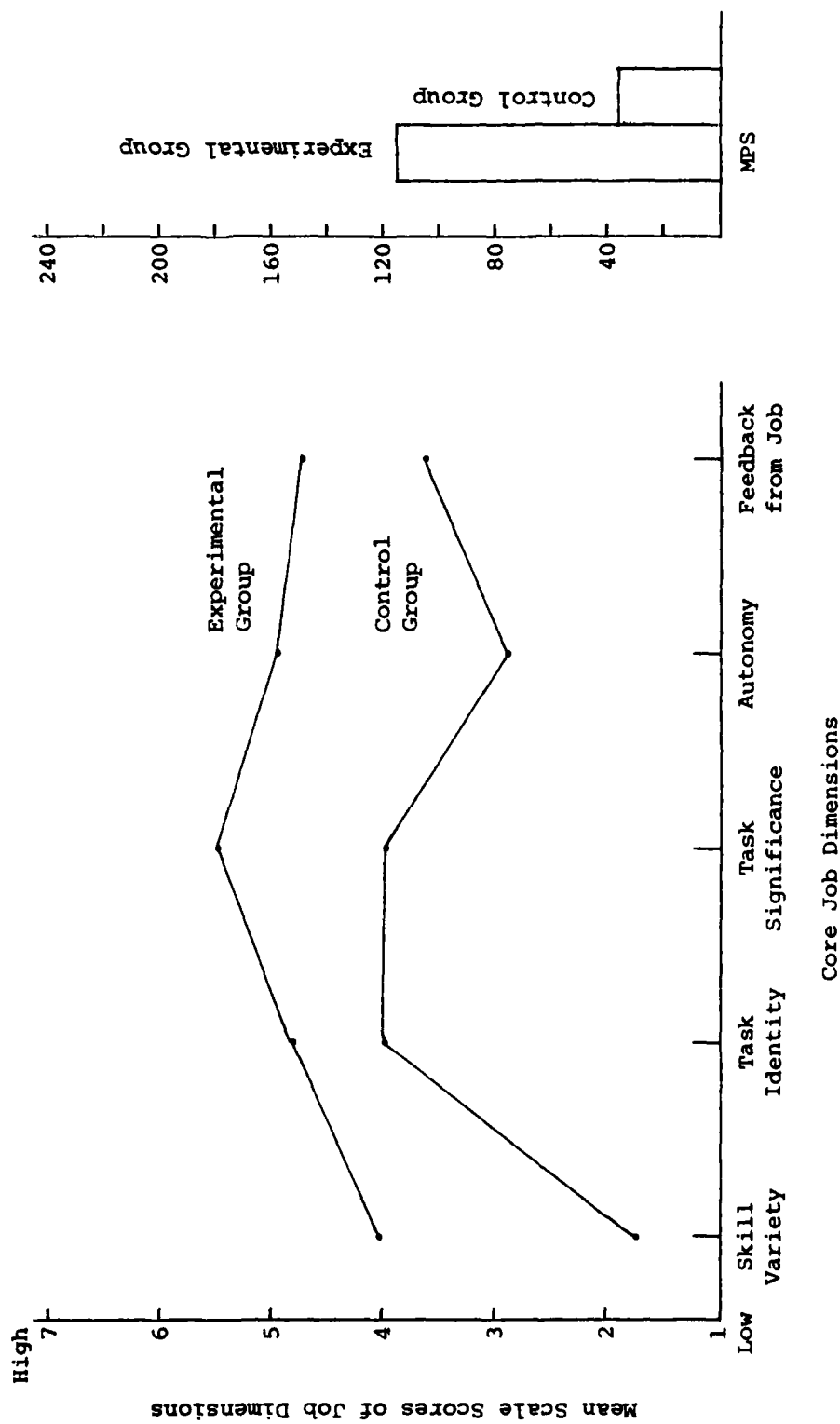


Figure 15. Comparison of Posttest Mean Job Dimension and MPS Scores from the Control and Experimental Groups

enriched job.

Work Redesign and the Critical
Psychological States

Work Redesign Leads to More
Experienced Meaningfulness

H1-7: Individuals working in the enriched job (experimental group) report significantly more experienced meaningfulness of the work than individuals working in the unenriched job (control group). Hypothesis 1-7 was confirmed by the data. Figure 16 illustrates the experienced meaningfulness scores on the JDS pretest and posttest for the experimental and control groups, and Table 15 presents the t-test results comparing the differences in the mean scores for this psychological state variable. The amount of experienced meaningfulness reported by Marines in the experimental group increased significantly ($p < .001$) from the pretest to the posttest, whereas the control group showed no significant change. There was no significant difference between the two groups at the pretest, whereas the mean score for experienced meaningfulness for the experimental group was significantly higher ($p < .001$) than that of the control group at the posttest. Working in an enriched job did lead to increased feelings of experienced meaningfulness of the work for the job incumbents.

Work Redesign Leads to More
Experienced Responsibility

H1-8: Individuals working in the enriched job

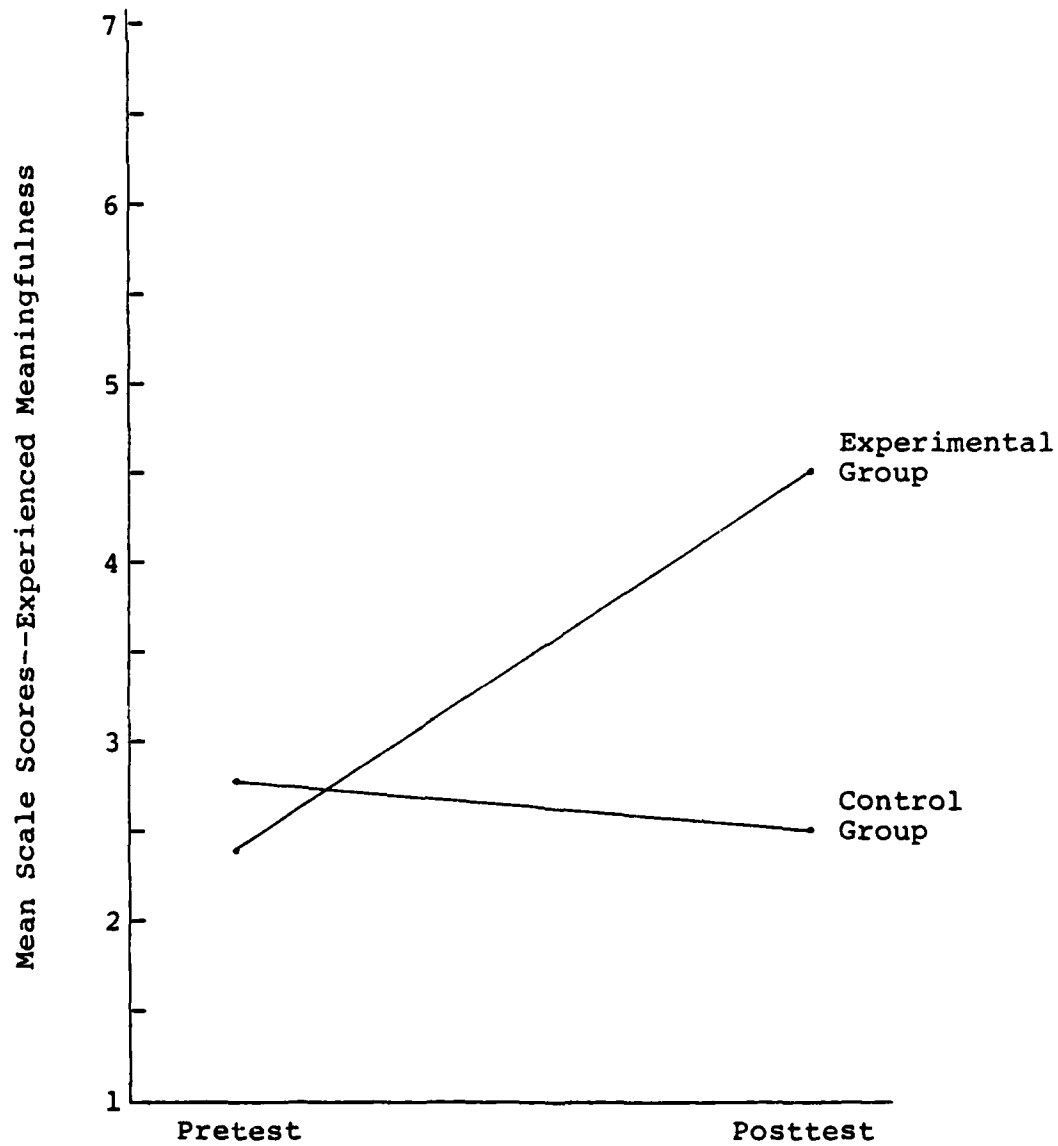


Figure 16. Comparison of Experienced Meaningfulness in Control and Experimental Groups Before and After Work Redesign

Table 15

t-Tests for the Effects of the Job Change
Implementations on Experienced
Meaningfulness

Experienced Meaningfulness					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	2.372	.996	.998	1.526	NS
Control Group (N=39)	2.795	1.923	1.387		
Pretest to Posttest Changes					
Experimental Group					
Pretest	2.372	.996	.998	8.246	p<.001
Posttest	4.468	1.459	1.208		
Control Group					
Pretest	2.795	1.923	1.387	1.029	NS
Posttest	2.487	1.484	1.218		
Posttest Comparison					
Experimental Group	4.468	1.459	1.208	7.118	p<.001
Control Group	2.487	1.484	1.218		

(experimental group) report significantly more experienced responsibility for the work than individuals working in the unenriched job (control group). Hypothesis 1-8 received strong support from the data. Figure 17 shows the mean scores for experienced responsibility for the experimental and control groups before and after the work redesign effort. Table 16 presents the t-test results and clearly shows the positive effects on experienced responsibility of working in an enriched job. The experimental group had a significantly lower ($p < .05$) mean score on the JDS pretest than did the control group, but on the posttest the reverse was true, with the experimental group's mean score significantly higher ($p < .001$) than that of the control group. There was no significant change in the control group's mean score from pretest to posttest, whereas the amount of experienced responsibility increased significantly for the experimental group. Work redesign did lead to increased feelings of experienced responsibility.

Work Redesign Leads to
Greater Knowledge of
Work Results

H1-9: Individuals working in the enriched job (experimental group) report significantly more knowledge of results of how effectively they are performing their jobs than individuals working in the unenriched job (control group). Hypothesis 1-9 was strongly supported by the research findings. Figure 18 illustrates the JDS

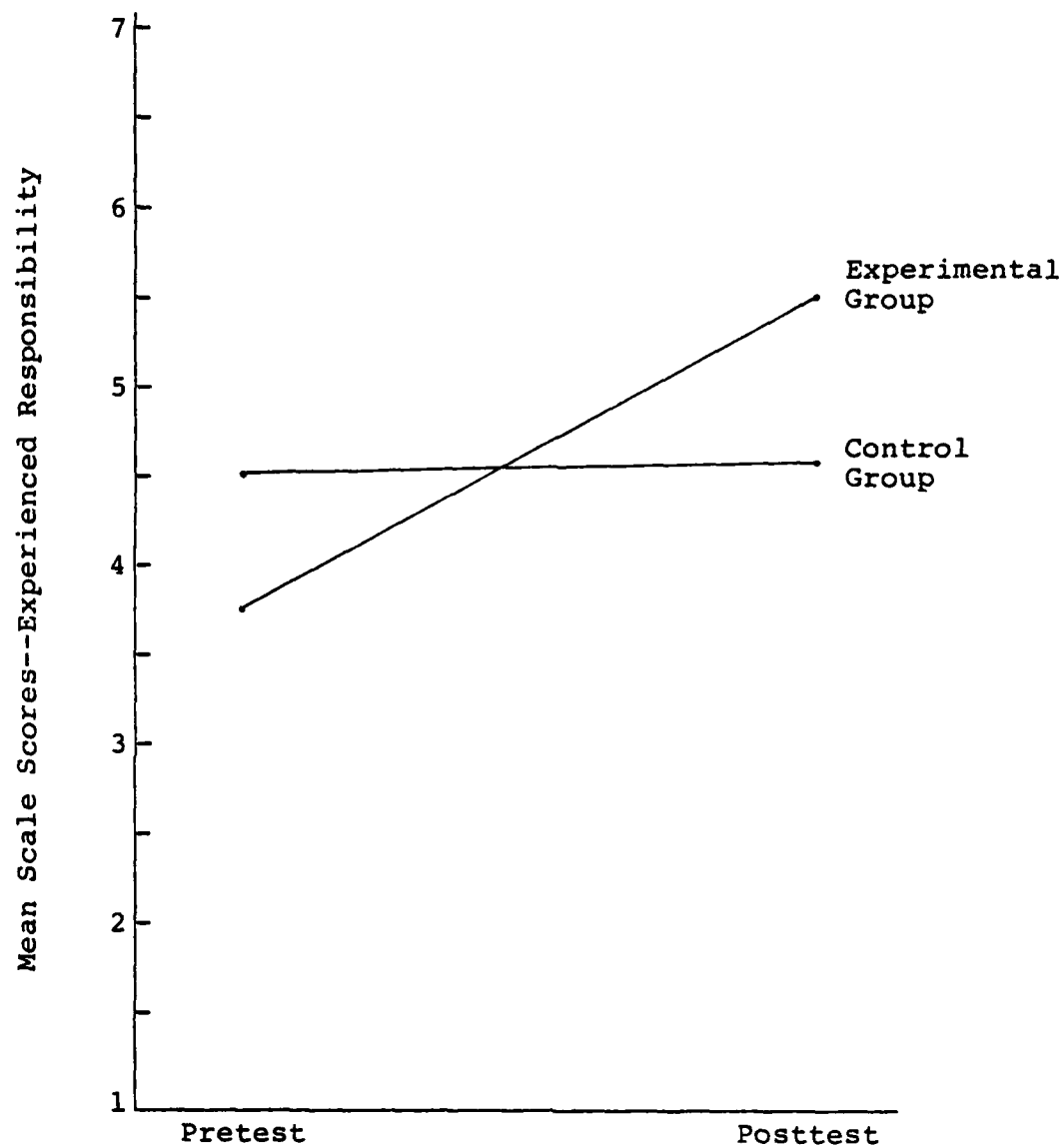


Figure 17. Comparison of Experienced Responsibility in Control and Experimental Groups Before and After Work Redesign

Table 16

t-Tests for the Effects of the Job Change
Implementations on Experienced
Responsibility

Experienced Responsibility					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	3.786	1.014	1.007	2.277	p<.05
Control Group (N=39)	4.478	2.496	1.580		
Pretest to Posttest Changes					
Experimental Group					
Pretest	3.786	1.014	1.007	8.888	p<.001
Posttest	5.538	.463	.680		
Control Group					
Pretest	4.478	2.496	1.580	.307	NS
Posttest	4.568	.760	.872		
Posttest Comparison					
Experimental Group	5.538	.463	.680	5.407	p<.001
Control Group	4.568	.760	.872		

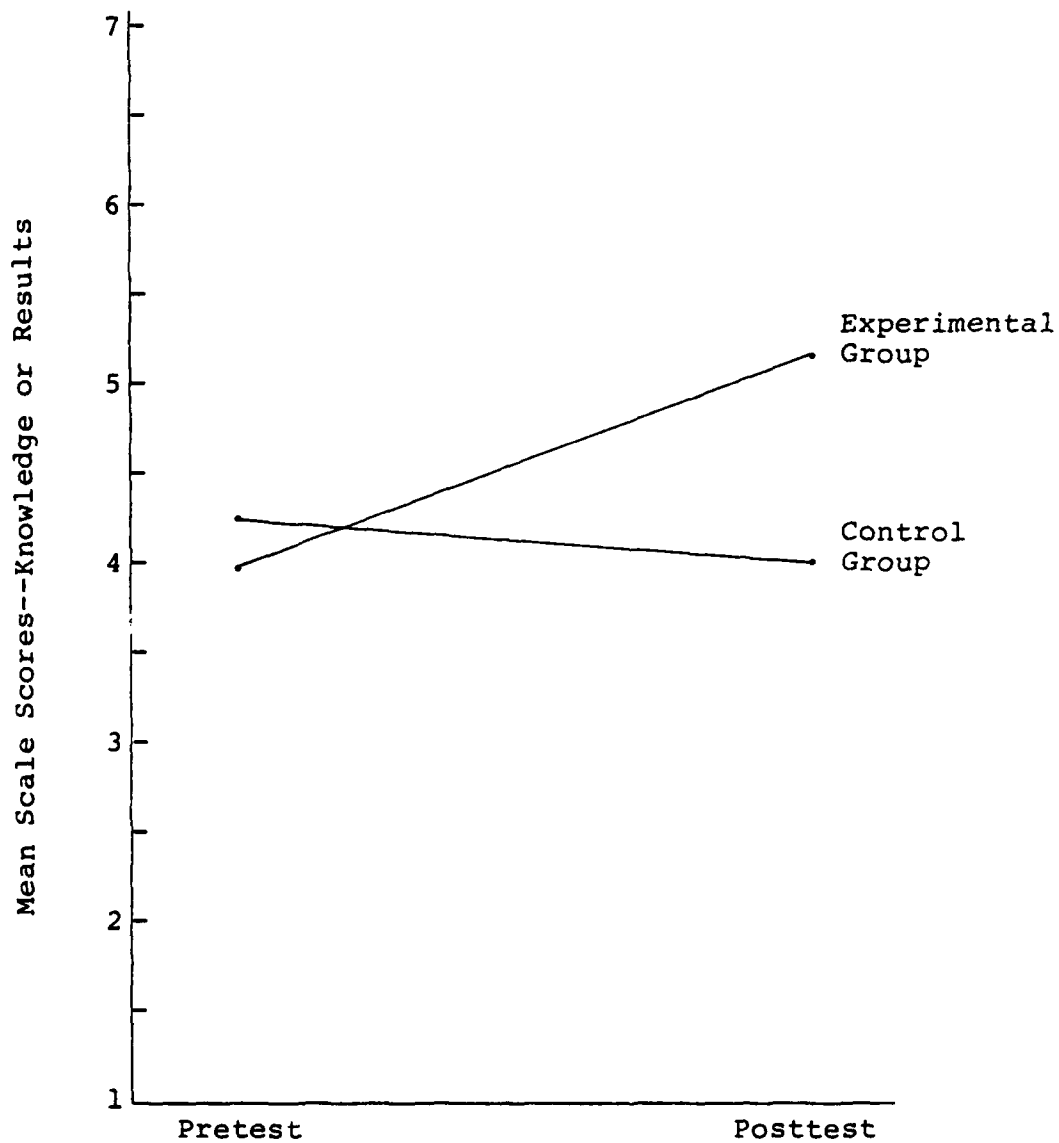


Figure 18. Comparison of Reported Knowledge of Results in Control and Experimental Groups Before and After Work Redesign

pretest and posttest mean scores for the experimental and control groups on reported knowledge of results. The t-test results shown in Table 17 indicated that while there was no significant difference between the two groups prior to the job changes, the mean score for knowledge of results was significantly higher in the experimental group ($p < .001$) than in the control group after the job changes. The control group's mean score did not change significantly from pretest to posttest, but the experimental group's mean score increased significantly ($p < .001$). Working in enriched jobs did lead to increased knowledge of work results for the Marine guards.

Hypotheses 1-7 through 1-9 predicted that the mean scores on the JDS posttest for each critical psychological state--experienced meaningfulness, experienced responsibility, and knowledge of results--would be greater for workers in the enriched group than for workers in the control group. These predictions were strongly supported by the research findings.

Work Redesign and Organizational and Personal Outcomes

Work Redesign Leads to Increased Job Satisfaction

H1-10: Individuals working in the enriched job
(experimental group) report significantly more job satis-
faction than individuals working in the unenriched job

Table 17
t-Tests for the Effects of the Job Change
 Implementations on Knowledge
 of Work Results

Knowledge of Results					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	3.962	1.646	1.283	1.103	NS
Control Group (N=39)	4.269	1.299	1.140		
Pretest to Posttest Changes					
Experimental Group					
Pretest	3.962	1.646	1.283	5.095	p<.001
Posttest	5.199	.594	.770		
Control Group					
Pretest	4.269	1.299	1.140	.935	NS
Posttest	4.019	1.415	1.189		
Posttest Comparison					
Experimental Group	5.199	.594	.770	5.132	p<.001
Control Group	4.019	1.415	1.189		

(control group). Hypothesis 1-10 received strong support from the data. Figure 19 illustrates the JDS mean scores for general job satisfaction for the experimental and control groups before and after the work redesign effort. The t-test results depicted in Table 18 showed that the control group's mean score for job satisfaction was significantly higher ($p < .05$) at the pretest than that of the experimental group, whereas at the posttest the mean score of the experimental group was significantly higher ($p < .001$) than that of the control group. There was no significant pretest to posttest change for the control group, but the experimental group showed a significant increase ($p < .001$) in job satisfaction. The work redesign effort did lead to increased job satisfaction for Marines in the experimental group.

Work Redesign Leads to
Increased Internal
Work Motivation

H1-11: Individuals working in the enriched job (experimental group) report significantly more internal work motivation than individuals working in the unenriched job (control group). Hypothesis 1-11 was confirmed by the data. Figure 20 shows the mean scores for internal work motivation for the experimental and control groups before and after the job changes, and Table 19 depicts the t-test results analyzing those mean differences. There was no significant difference between the two groups prior to

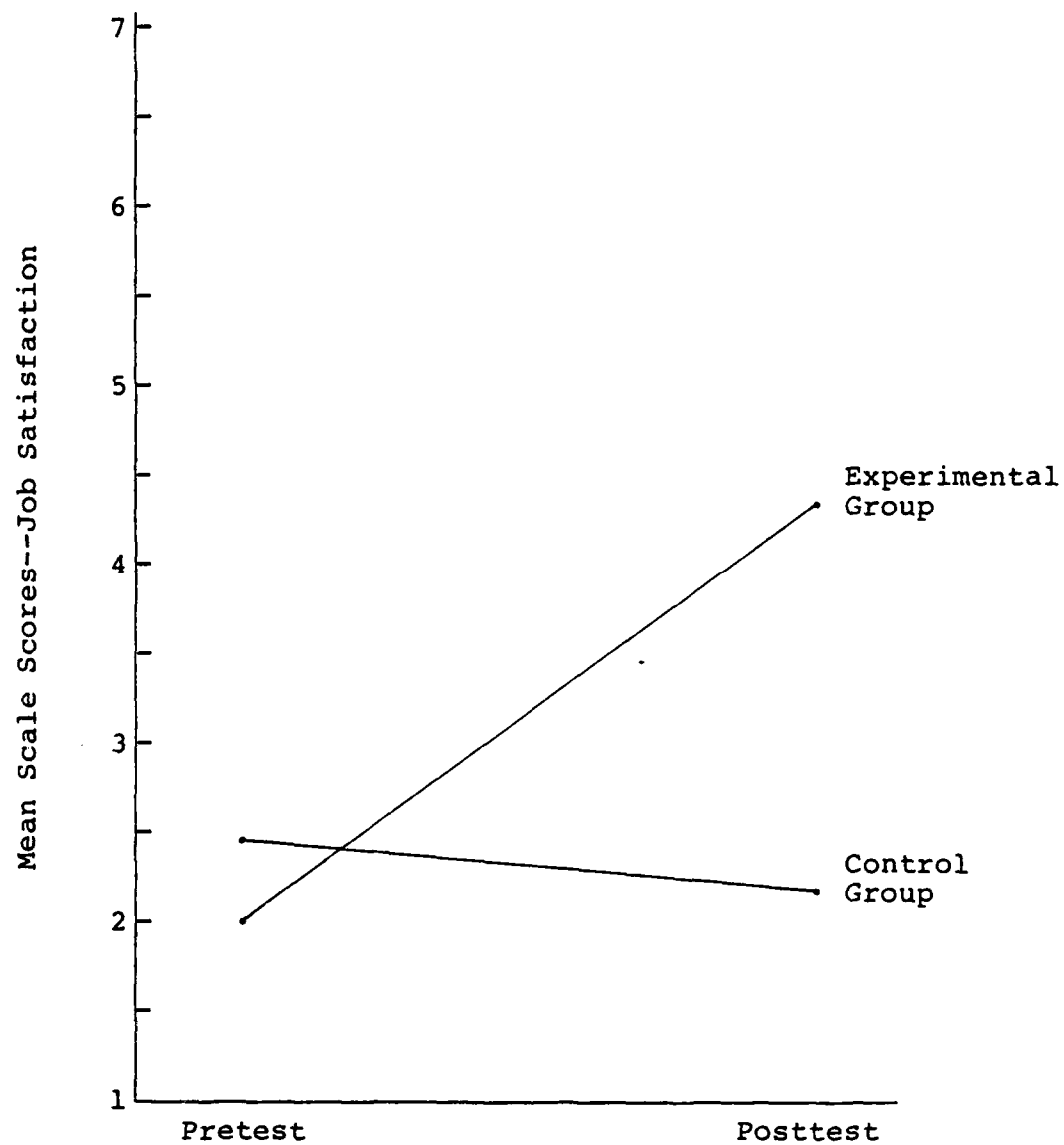


Figure 19. Comparison of Job Satisfaction in Control and Experimental Groups Before and After Work Redesign

Table 18
t-Tests for the Effects of the Job Change
 Implementations on Worker
 Job Satisfaction

Job Satisfaction					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	1.969	.258	.507	2.030	p<.05
Control Group (N=39)	2.431	1.710	1.308		
Pretest to Posttest Changes					
Experimental Group					
Pretest	1.969	.258	.507	11.987	p<.001
Posttest	4.349	1.240	1.114		
Control Group					
Pretest	2.431	1.710	1.308	1.314	NS
Posttest	2.087	.896	.947		
Posttest Comparison					
Experimental Group	4.349	1.240	1.114	9.541	p<.001
Control Group	2.087	.896	.947		

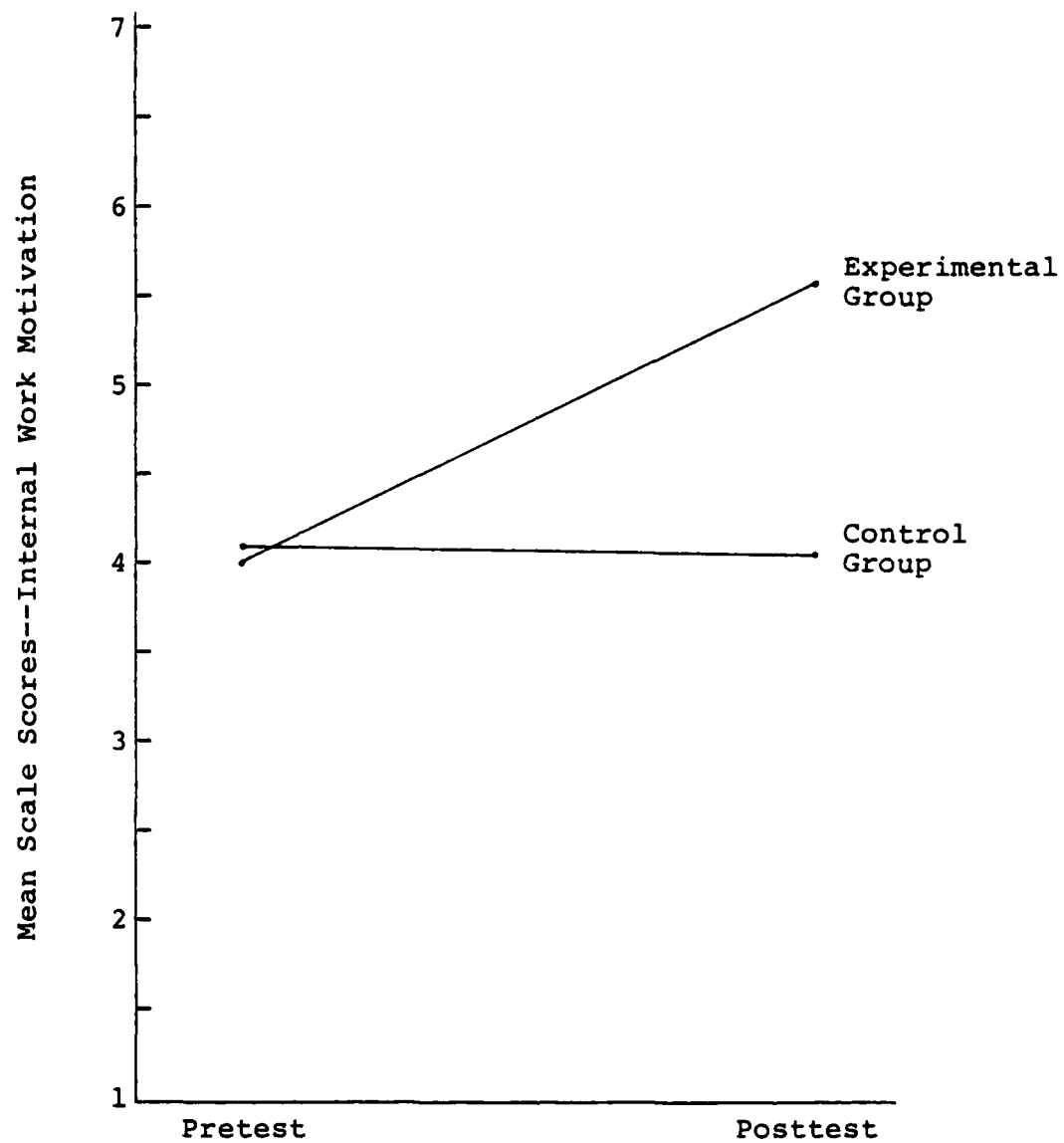


Figure 20. Comparison of Internal Work Motivation in Control and Experimental Groups Before and After Work Redesign

Table 19

t-Tests for the Effects of the Job Change
Implementations on Internal
Work Motivation

Internal Work Motivation					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
Experimental Group (N=39)	3.983	.957	.926	.380	NS
Control Group (N=39)	4.081	1.675	1.294		
Pretest to Posttest Changes					
Experimental Group					
Pretest	3.983	.957	.926	8.351	p<.001
Posttest	5.568	.512	.716		
Control Group					
Pretest	4.081	1.675	1.294	.078	NS
Posttest	4.059	1.363	1.167		
Posttest Comparison					
Experimental Group	5.568	.512	.716	6.793	p<.001
Control Group	4.059	1.363	1.167		

the job changes, but following the job changes the experimental group reported significantly more ($p < .001$) internal work motivation than did the control group. The mean score for internal work motivation for the experimental group increased significantly ($p < .001$) from the pretest to the posttest, while there was no significant change in the control group. Working in enriched jobs did lead to increased internal work motivation.

Work Redesign Leads to
Improved Job Performance

H1-12: Individuals working in the enriched job (experimental group) are rated significantly better in their job performance than individuals working in the unenriched job (control group). Hypothesis 1-12 was confirmed by the research findings. Figure 21 illustrates the mean scores for the Detachment Commanders' job performance evaluations for the experimental and control groups before and after the job changes. Table 20 depicts the descriptive statistics for proficiency marks (performance) for the two groups, and Table 21 shows the number and percentage of Marine guards placed in proficiency (performance) categories (poor, fair, good, and excellent) before and after the work redesign. The results of the t-tests comparing the mean scores for job performance are shown in Table 22. The data analyses indicated that there was no significant difference between the two groups before the work redesign project, but following the job changes

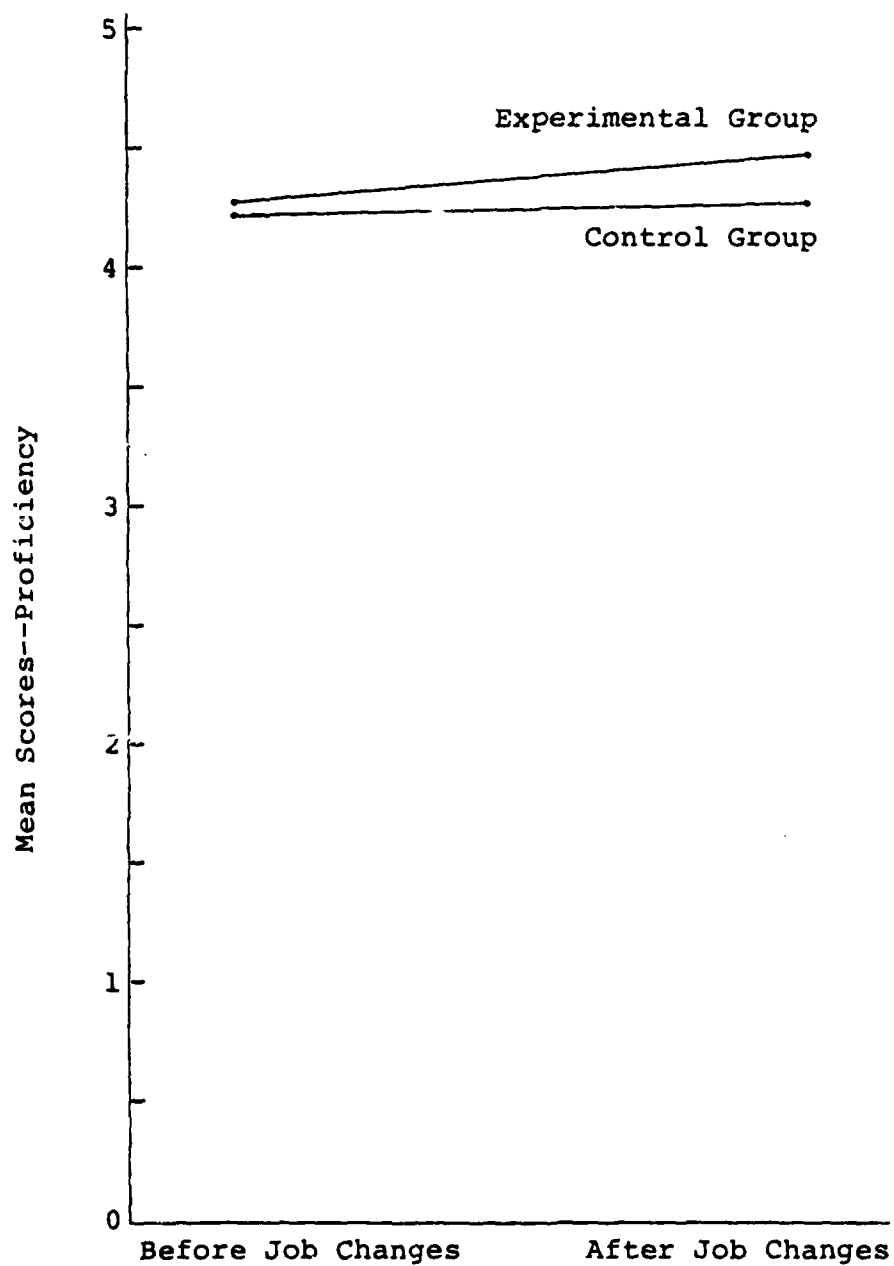


Figure 21. Comparison of Job Performance (Proficiency Ratings) in Control and Experimental Groups Before and After Work Redesign

the performance of the experimental group members was rated significantly better ($p < .02$) than that of the control group. The experimental group showed a significant increase ($p < .05$) in performance rating from pretest to post-test, whereas the control group did not change significantly. Work redesign did lead to improved job performance.

Table 20

Descriptive Statistics for Semi-Annual Conduct
and Proficiency Marks for the Control
and Experimental Groups

Group	1 Feb 1981 to 31 July 1981 (Before Work Redesign)				1 Aug 1981 to 31 Jan 1982 (After Work Redesign)			
	Conduct Mean S.D.		Proficiency Mean S.D.		Conduct Mean S.D.		Proficiency Mean S.D.	
Control	4.03	.56	4.22	.24	4.03	.54	4.21	.25
Experimental	4.06	.54	4.24	.24	4.25	.39	4.35	.25

Work Redesign Leads to
Improved Conduct

H1-13: Individuals working in the enriched job (experimental group) are rated significantly better in their conduct than individuals working in the unenriched job (control group). Hypothesis 1-13 received some support from the data. Figure 22 shows the mean scores of the Detachment Commanders' conduct ratings for the experimental and control groups before and after the job changes. Table 20 contains the descriptive statistics for conduct ratings

Table 21

Number and Percentage of Individuals Placed
in Conduct and Proficiency Categories
Before and After Work Redesign

Mark	Category	1 Feb 1981 to 31 July 1981 (Before Work Redesign)				1 Aug 1981 to 31 Jan 1982 (After Work Redesign)			
		Conduct		Proficiency		Conduct		Proficiency	
		N	%	N	%	N	%	N	%
2 to 2.9	Poor								
	Control Group	7	18	0	0	6	15	0	0
	Experimental Group	6	15	0	0	2	5	0	0
3 to 3.9	Fair								
	Control Group	4	10	3	8	5	13	3	8
	Experimental Group	5	13	3	8	3	8	2	5
4 to 4.4	Good								
	Control Group	21	54	29	74	22	56	29	74
	Experimental Group	21	54	29	74	23	59	23	59
4.5 to 4.8	Excellent								
	Control Group	7	18	7	18	6	15	7	18
	Experimental Group	7	18	7	18	11	28	14	36

Table 22

t-Tests for the Effects of the Job Change
Implementations on Marine Performance

	Performance					
	Mean	Variance	S.D.	t-Value		
<hr/>						
Pretest Comparison						
Experimental Group (N=39)	4.236	.056	.236	.276	NS	
Control Group (N=39)	4.221	.056	.237			
Pretest to Posttest Changes						
Experimental Group						
Pretest	4.236	.056	.236	2.045	p<.05	
Posttest	4.349	.060	.246			
Control Group						
Pretest	4.221	.056	.237	.287	NS	
Posttest	4.205	.062	.248			
Posttest Comparison						
Experimental Group	4.349	.060	.246	2.541	p<.02	
Control Group	4.205	.062	.248			

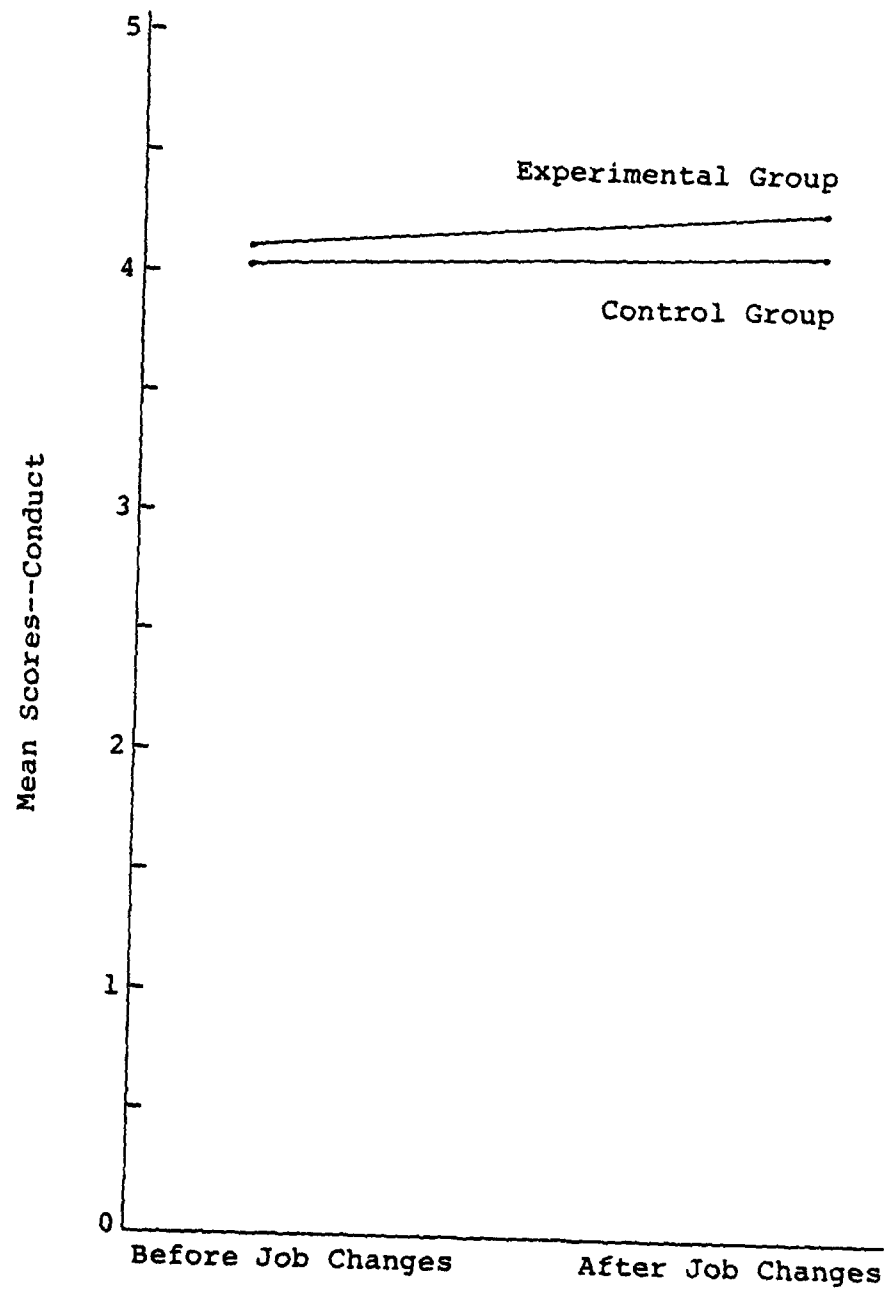


Figure 22. Comparison of Conduct Ratings in Control and Experimental Groups Before and After Work Redesign

for both groups, and Table 21 depicts the number and percentage of individuals placed in poor, fair, good, and excellent conduct categories before and after the work redesign. The t -test results shown in Table 23 indicated that although there was no significant difference between the groups before the job changes and neither group changed significantly from pretest to posttest, the experimental group's conduct was rated significantly better ($p < .05$) after the job changes than was the control group's. Working in enriched jobs did lead to improved conduct.

Work Redesign Leads to
Increased Work Attendance

H1-14: Individuals working in the enriched job (experimental group) have significantly fewer occasions of absenteeism than individuals working in the unenriched job (control group). Hypothesis 1-14 was not supported by the data. Figure 23 shows the number of occasions of absenteeism for the experimental and control groups for two months preceding the pretest and two months preceding the posttest. Although absenteeism decreased in the experimental group and increased in the control group following the job changes, these changes were not statistically significant. The chi-square analysis depicted in Table 24 showed no significant differences between the groups and indicated that the number of occasions of absenteeism was independent of membership in the experimental or control group. Work redesign did not lead to

Table 23

t-Tests for the Effects of the Job Change
Implementations on Marine Conduct

	Conduct					
	Mean	Variance	S.D.	<u>t</u> -Value		
Pretest Comparison						
Experimental Group (N=39)	4.064	.292	.540	.284	NS	
Control Group (N=39)	4.028	.318	.564			
Pretest to Posttest Changes						
Experimental Group						
Pretest	4.064	.292	.540	1.734	NS	
Posttest	4.251	.150	.387			
Control Group						
Pretest	4.028	.318	.564	.000	NS	
Posttest	4.028	.287	.536			
Posttest Comparison						
Experimental Group	4.251	.150	.387	2.079	p<.05	
Control Group	4.028	.287	.536			

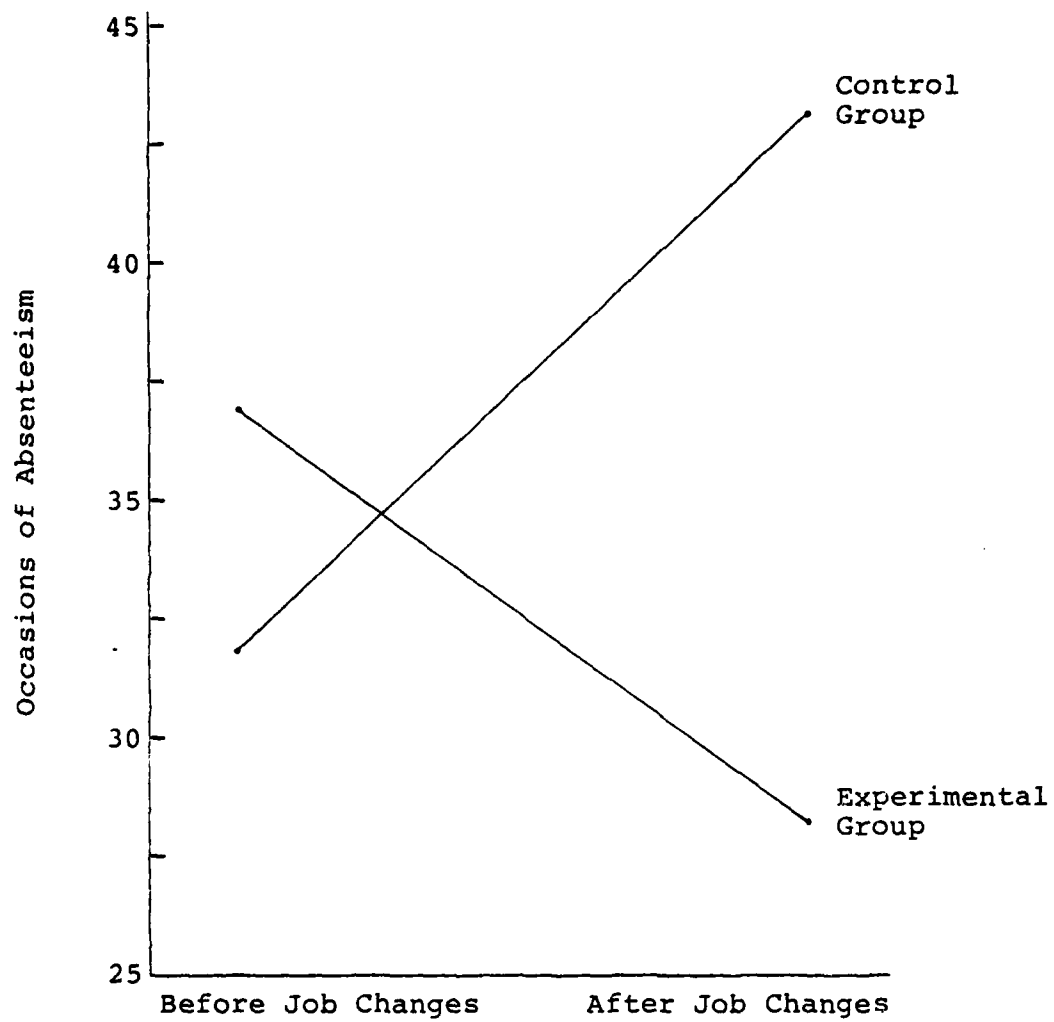


Figure 23. Comparison of Occasions of Absenteeism in Control and Experimental Groups Before and After Work Redesign

increased work attendance.

Table 24

Chi-Square Analysis of Absenteeism for the
Experimental and Control Groups

Occasions of Absenteeism				
1 June 1981 to 31 July 1981		1 December 1981 to 31 January 1982		
Control Group	32	36.7	43	38.3
				75
Experimental Group	37	32.3	29	33.7
				66
	69		72	141

$$\chi^2 = 2.52, \text{ NS}$$

Hypotheses 1-10 through 1-14 predicted that the affective and behavioral responses to the job would be greater for the experimental group than for the control group. Generally these hypotheses were supported by the research findings. The affective responses of general job satisfaction and internal work motivation were strongly supported by the data. The findings dealing with the behavioral responses of job performance and conduct were weaker but significant and supportive. The hypothesis

predicting that the number of occasions individuals were absent from work would be less for the experimental group than for the control group was not confirmed by the data.

Work Redesign and the Moderating Effect of Growth Need Strength

The second major hypothesis tested dealt with the moderating effect of the individual difference characteristic, growth need strength. The growth need strength scores of the experimental group on the "would like" measure of the JDS were rank ordered and then divided into quartiles. The top quartile was designated the high growth need strength group ($N = 10$, $\bar{X} = 7.00$ on the pretest; $N = 10$, $\bar{X} = 6.73$ on the posttest) and the bottom quartile was designated the low growth need strength group ($N = 10$, $\bar{X} = 4.12$ on the pretest; $N = 10$, $\bar{X} = 4.27$ on the posttest). Subgroup analyses were then performed on these two groups to determine the moderating effect of growth need strength on Experienced Meaningfulness, Experienced Responsibility, Knowledge of Results, General Job Satisfaction, Internal Work Motivation, and Supervisory Satisfaction. The pretest and posttest descriptive statistics on these variables for the two groups are shown in Table 25.

Growth Need Strength and Experienced Meaningfulness

H2-1: Individuals with high growth need strength
in the experimental group report significantly more

Table 25

JDS Pretest and Posttest Descriptive Statistics
for High and Low Growth Need Strength Groups

JDS Variable	Pretest ^a		Posttest ^b	
	Mean Score	Standard Deviation	Mean Score	Standard Deviation
Experienced Meaningfulness				
High GNS Group	2.73	1.03	5.43	.70
Low GNS Group	2.10	.78	3.35	1.06
Experienced Responsibility				
High GNS Group	4.35	.41	6.25	.61
Low GNS Group	4.93	.42	4.72	.17
Knowledge of Results				
High GNS Group	3.68	1.09	5.68	1.15
Low GNS Group	4.08	.99	4.80	.31
Job Satisfaction				
High GNS Group	2.22	.38	5.10	.94
Low GNS Group	2.02	.43	3.08	.29
Internal Work Motivation				
High GNS Group	4.63	.64	6.13	.69
Low GNS Group	4.07	.63	4.97	.80
Supervisory Satisfaction				
High GNS Group	2.60	.89	6.23	.15
Low GNS Group	3.50	.72	4.30	1.17

^aHigh GNS Group N=10, \bar{X} =7.00 on "Would Like" measure of GNS.
Low GNS Group N=10, \bar{X} =4.12.

^bHigh GNS Group N=10, \bar{X} =6.73. Low GNS Group N=10, \bar{X} =4.27.

experienced meaningfulness of their enriched job than individuals with low growth need strength. Hypothesis 2-1 was supported by the posttest data, although the results were somewhat difficult to interpret. Figure 24 illustrates the pretest and posttest mean scores for experienced meaningfulness for the high and low growth need strength groups and Table 26 shows the t -test results comparing these scores. The t -tests produced significance for each comparison. Although the high GNS group showed significantly more ($p < .001$) experienced meaningfulness at the posttest than the low GNS group, it was also significantly higher ($p < .01$) at the pretest. Both groups' mean scores for experienced meaningfulness increased significantly ($p < .001$) from the pretest to the posttest with the high GNS group increasing more dramatically ($t = 13.395$ compared to $t = 5.86$ for the low GNS group). Work redesign did lead to increased feelings of experienced meaningfulness of the work for both the high and low GNS groups.

Growth Need Strength and Experienced Responsibility

H2-2: Individuals with high growth need strength in the experimental group report significantly more experienced responsibility for their enriched job than individuals with low growth need strength. Hypothesis 2-2 was strongly supported by the research findings. Figure 25 shows the mean scores for experienced responsibility on the JDS pretest and posttest for the high and low GNS groups.

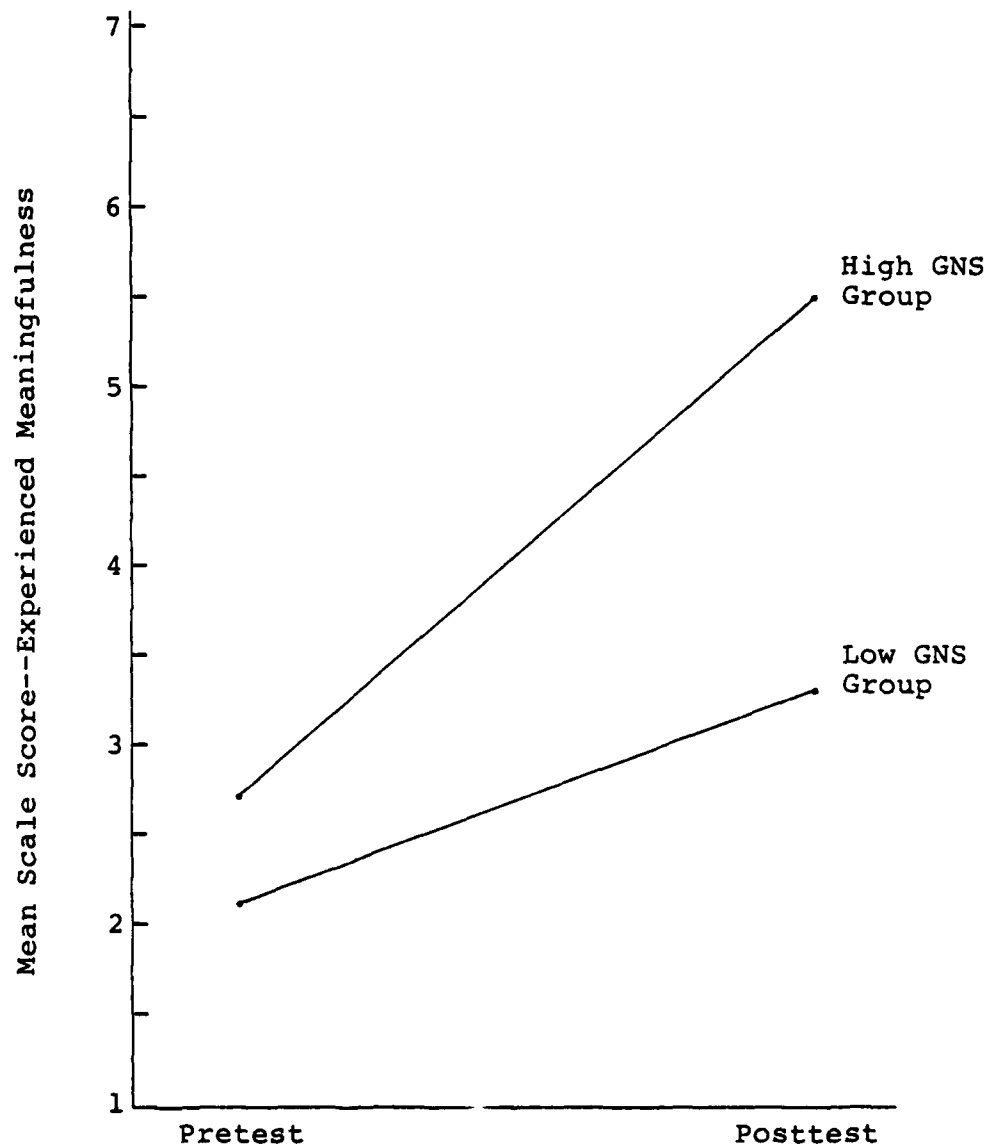


Figure 24. Comparison of Experienced Meaningfulness in High and Low Growth Need Strength Groups Before and After Work Redesign

Table 26

t-Tests for the Moderating Effect of Growth Need
Strength on Experienced Meaningfulness

Experienced Meaningfulness					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
High GNS Group (N=10)	2.725	1.056	1.027	2.991	p<.01
Low GNS Group (N=10)	2.100	.603	.776		
Pretest to Posttest Changes					
High GNS Group					
Pretest	2.725	1.056	1.027	13.395	p<.001
Posttest	5.425	.488	.699		
Low GNS Group					
Pretest	2.100	.603	.776	5.860	p<.001
Posttest	3.350	1.128	1.062		
Posttest Comparison					
High GNS Group	5.425	.488	.699	10.062	p<.001
Low GNS Group	3.350	1.128	1.062		

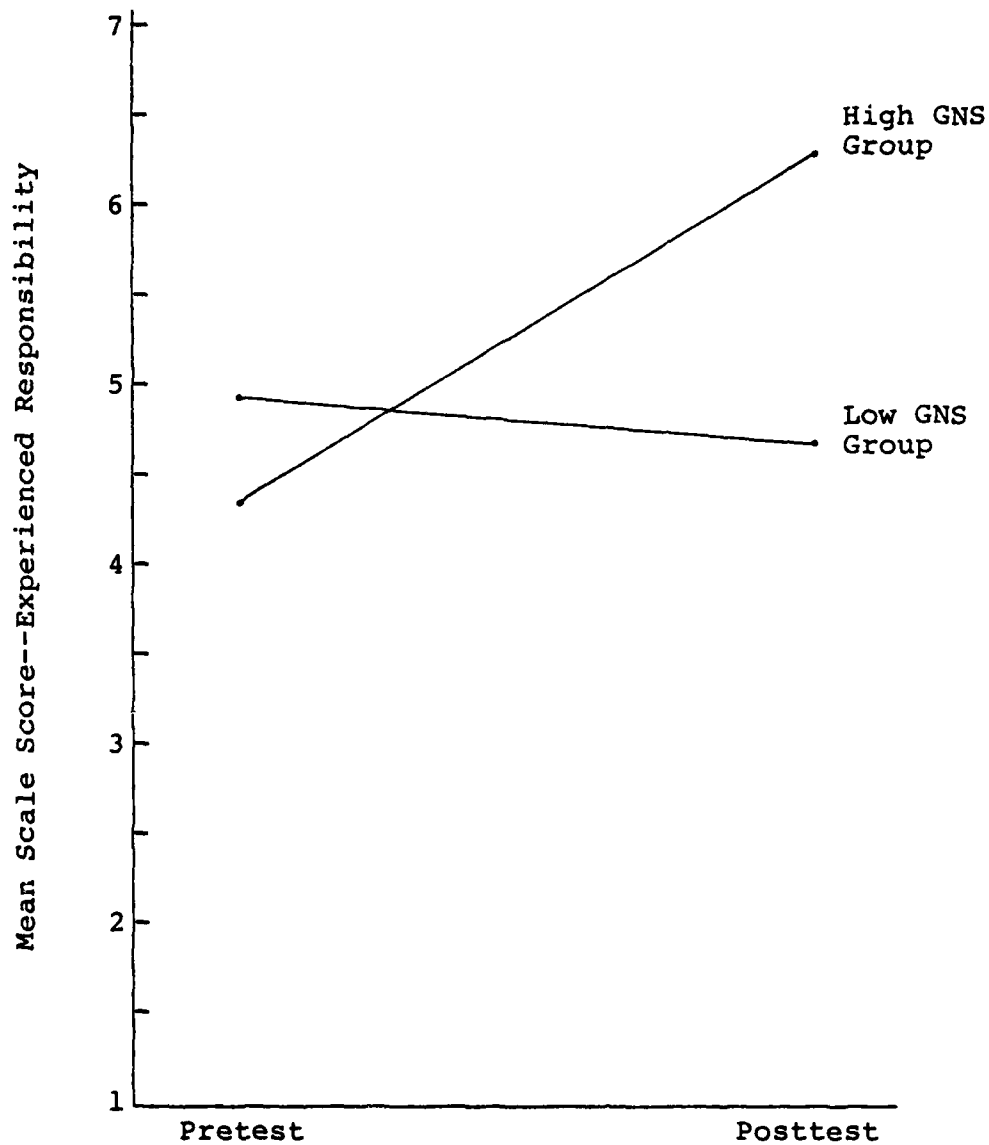


Figure 25. Comparison of Experienced Responsibility in High and Low Growth Need Strength Groups Before and After Work Redesign

The t-test analyses depicted in Table 27 clearly showed that while the mean score for experienced responsibility for the high GNS group was significantly lower ($p < .001$) than that of the low GNS group at the pretest, it was significantly higher ($p < .001$) at the posttest. Feelings of experienced responsibility significantly increased ($p < .001$) from the pretest to the posttest for the high GNS group and significantly decreased ($p < .01$) during the same time span for the low GNS group. Working in enriched jobs did lead to increased feelings of experienced responsibility for the work for high GNS individuals.

Growth Need Strength and Knowledge of Work Results

H2-3: Individuals with high growth need strength in the experimental group report significantly more knowledge of results of how effectively they are performing their enriched job than individuals with low growth need strength. Hypothesis 2-3 received strong support from the data. The pretest and posttest mean scores for reported knowledge of work results for the high and low growth need strength groups are shown in Figure 26. The results of the t-tests shown in Table 28 indicated that there was no significant difference between the groups at the pretest, whereas the high GNS group reported significantly more ($p < .001$) knowledge of results than the low GNS group at the posttest. Both groups showed significant increases ($p < .001$) in this critical psychological

Table 27

t-Tests for the Moderating Effect of Growth Need
Strength on Experienced Responsibility

Experienced Responsibility					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
High GNS Group (N=10)	4.348	.170	.413	6.136	p<.001
Low GNS Group (N=10)	4.931	.173	.416		
Pretest to Posttest Changes					
High GNS Group					
Pretest	4.348	.170	.413	15.926	p<.001
Posttest	6.250	.372	.610		
Low GNS Group					
Pretest	4.931	.173	.416	2.929	p<.01
Posttest	4.718	.028	.117		
Posttest Comparison					
High GNS Group	6.250	.372	.610	14.932	p<.001
Low GNS Group	4.718	.028	.117		

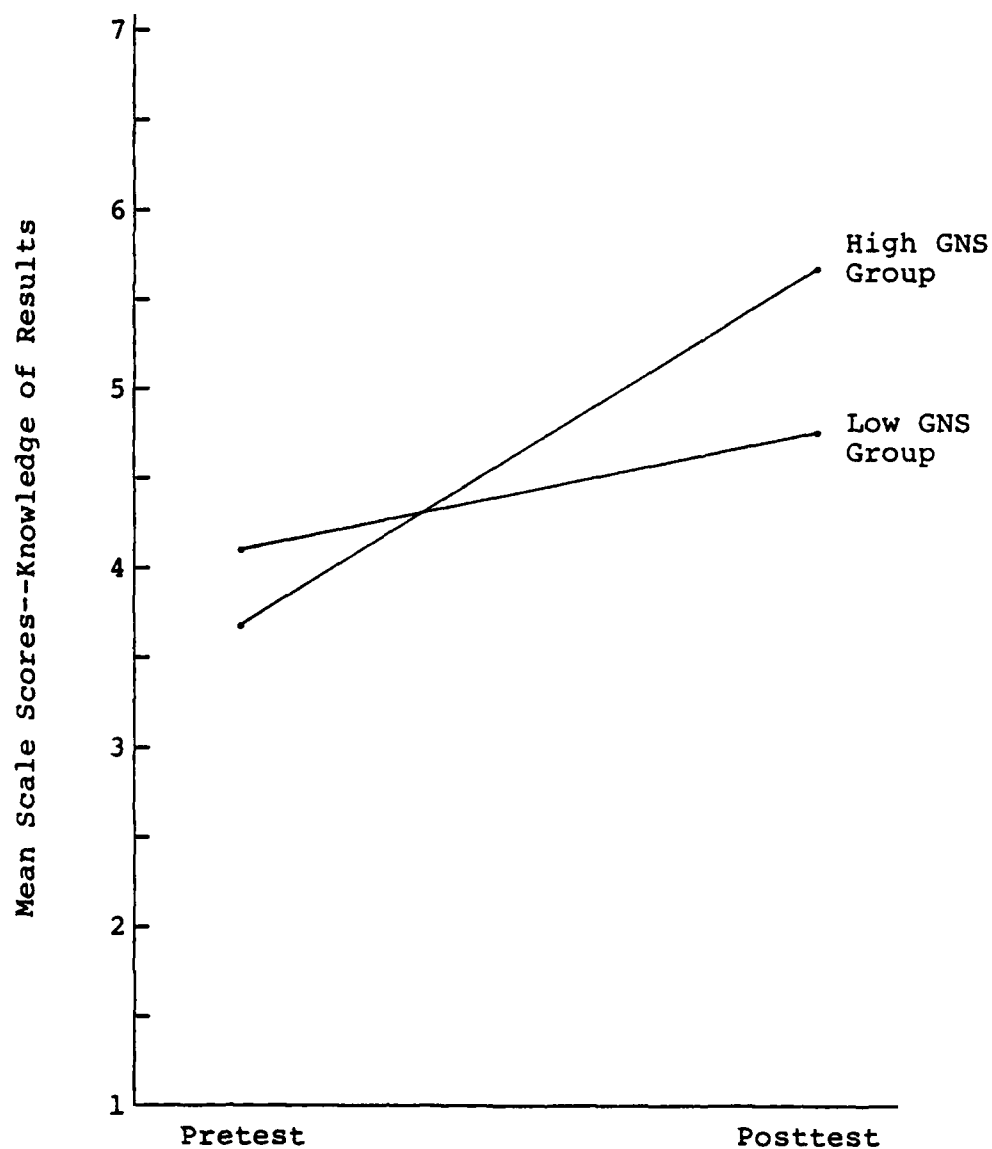


Figure 26. Comparison of Reported Knowledge of Results in High and Low Growth Need Strength Groups Before and After Work Redesign

Table 28

t-Tests for the Moderating Effect of Growth Need
Strength on Knowledge of Work Results

Knowledge of Results					
	Mean	Variance	S.D.	<u>t</u> -Value	
Pretest Comparison					
High GNS Group (N=10)	3.675	1.188	1.090	1.672	NS
Low GNS Group (N=10)	4.075	.988	.994		
Pretest to Posttest Changes					
High GNS Group					
Pretest	3.675	1.188	1.090	7.776	p<.001
Posttest	5.675	1.326	1.151		
Low GNS Group					
Pretest	4.075	.988	.994	4.289	p<.001
Posttest	4.800	.098	.312		
Posttest Comparison					
High GNS Group	5.675	1.326	1.151	4.520	p<.001
Low GNS Group	4.800	.098	.312		

state variable from the pretest to the posttest. Work redesign did lead to increased knowledge of work results for both high and low GNS groups with the high GNS group showing a more substantial increase.

Growth Need Strength and Job Satisfaction

H2-4: Individuals with high growth need strength in the experimental group report significantly more satisfaction with their enriched job than individuals with low growth need strength. Hypothesis 2-4 was confirmed by the posttest data, but the results presented some interpretation difficulties. The mean JDS pretest and posttest scores for job satisfaction for the high and low growth need strength groups are illustrated in Figure 27 and the t-test analyses examining these scores are shown in Table 29. Job satisfaction increased significantly ($p < .001$) and substantially (an increase of 2.88 points on a 7-point scale yielding a t-value of 17.493) for the high GNS group after the job changes, and the job satisfaction mean score for the high GNS group was significantly higher ($p < .001$) than that of the low GNS group at the posttest. These results provided strong support for the hypothesis. However, job satisfaction also increased significantly ($p < .001$) for the low GNS group from the pretest to the posttest, and the job satisfaction mean score for the high GNS group was significantly higher ($p < .05$) than that of the low GNS group at the pretest. These results made interpretation regarding the

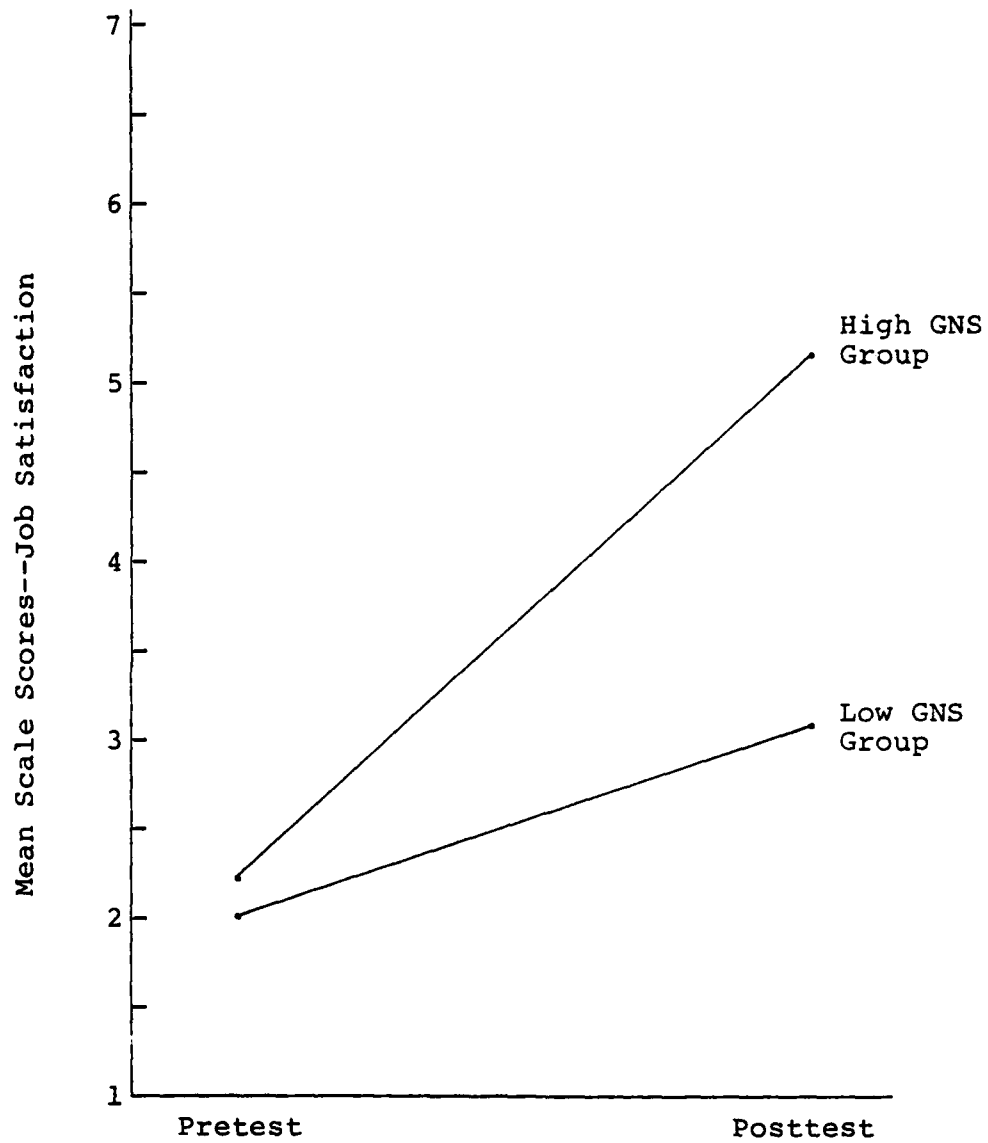


Figure 27. Comparison of Job Satisfaction in High and Low Growth Need Strength Groups Before and After Work Redesign

Table 29

t-Tests for the Moderating Effect of Growth Need
Strength on Job Satisfaction

	Job Satisfaction					
	Mean	Variance	S.D.	t-Value		
Pretest Comparison						
High GNS Group (N=10)	2.220	.148	.384	2.127	p<.05	
Low GNS Group (N=10)	2.020	.188	.433			
Pretest to Posttest Changes						
High GNS Group						
Pretest	2.220	.148	.384	17.493	p<.001	
Posttest	5.100	.882	.939			
Low GNS Group						
Pretest	2.020	.188	.433	12.575	p<.001	
Posttest	3.080	.082	.286			
Posttest Comparison						
High GNS Group	5.100	.882	.939	12.682	p<.001	
Low GNS Group	3.080	.082	.286			

moderating effect of growth need strength on job satisfaction more difficult. Although the significant increase in job satisfaction for the high GNS group following the job changes was more dramatic than that of the low GNS group and produced a significantly higher posttest mean score, both groups benefitted from work redesign.

Growth Need Strength and Internal Work Motivation

H2-5: Individuals with high growth need strength in the experimental group report significantly more internal work motivation as a result of their enriched jobs than individuals with low growth need strength. Hypothesis 2-5 was confirmed by the posttest data, but because of the significant difference between the two groups at the pretest (Table 30), interpretation was difficult. Figure 28 shows the pretest and posttest internal work motivation mean scores for the high and low growth need strength groups and Table 30 shows the t-test results from comparing these scores. Although the high GNS group's mean score was significantly higher ($p < .001$) than that of the low GNS group at the posttest, that was also the case at the pretest. Both groups showed significant ($p < .001$) increases from the pretest to posttest. It was impossible to assess the moderating effect of growth need strength on internal work motivation.

Table 30

t-Tests for the Moderating Effects of Growth Need
Strength on Internal Work Motivation

	Internal Work Motivation					
	Mean	Variance	S.D.	t-Value		
Pretest Comparison						
High GNS Group (N=10)	4.633	.406	.637	3.906	p<.001	
Low GNS Group (N=10)	4.067	.392	.626			
Pretest to Posttest Changes						
High GNS Group						
Pretest	4.633	.406	.637	9.840	p<.001	
Posttest	6.133	.477	.691			
Low GNS Group						
Pretest	4.067	.392	.626	5.456	p<.001	
Posttest	4.967	.642	.801			
Posttest Comparison						
High GNS Group	6.133	.477	.691	6.795	p<.001	
Low GNS Group	4.967	.642	.801			

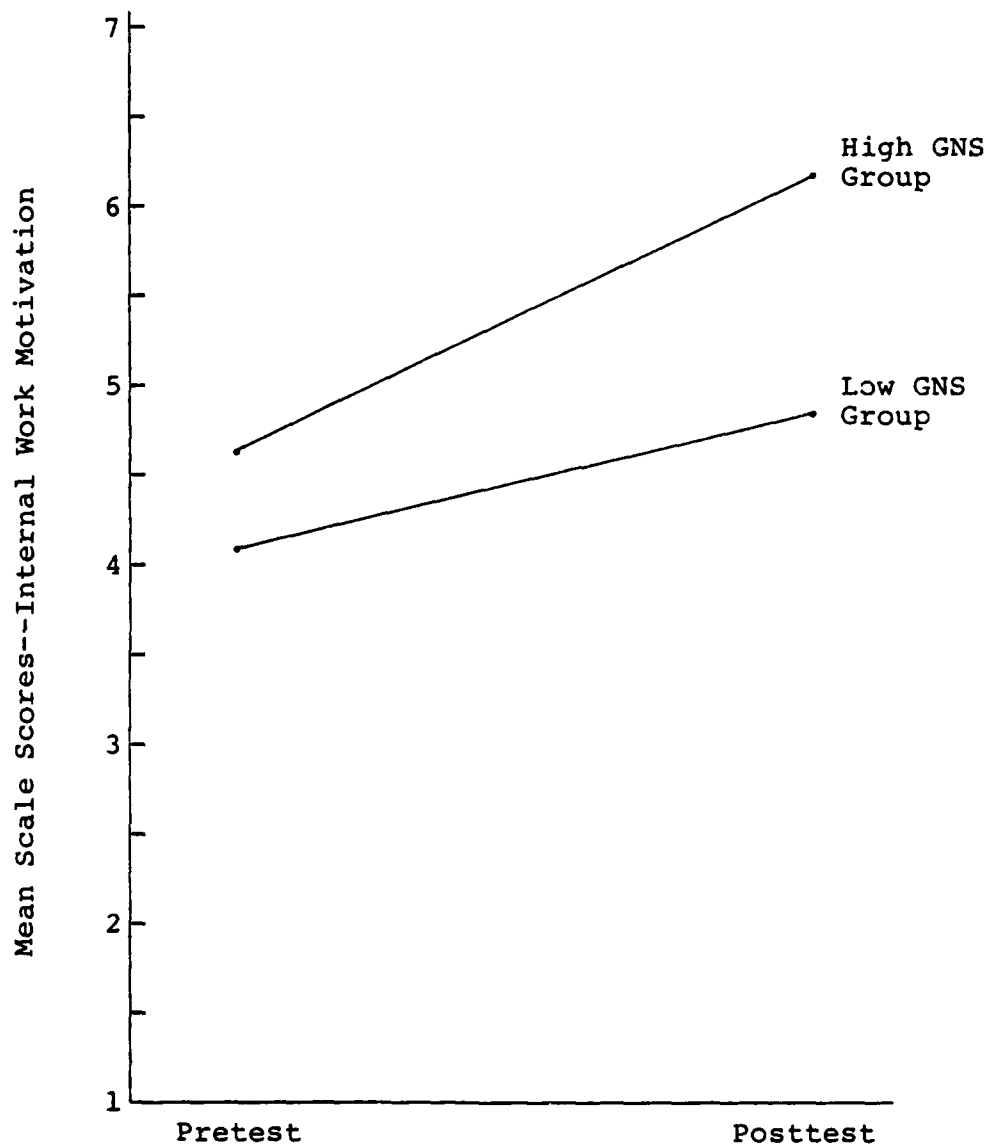


Figure 28. Comparison of Internal Work Motivation in High and Low Growth Need Strength Groups Before and After Work Redesign

Growth Need Strength and
Supervisory Satisfaction

H2-6: Individuals with high growth need strength in the experimental group report significantly more satisfaction with supervision than individuals with low growth need strength. Hypothesis 2-6 was strongly supported by the research findings, as illustrated by Figure 29 showing pretest and posttest mean scores for satisfaction with supervision for the high and low growth need strength groups. The t-test results shown in Table 31 demonstrated that although the high GNS group's satisfaction with supervision was significantly lower ($p < .001$) than the low GNS group's before the job changes, it was significantly higher ($p < .001$) than that of the low GNS group following the job changes. Both groups showed significant increases ($p < .001$) from pretest to posttest, but the high GNS group increased very substantially (an increase of 3.632 points on a 7-point scale, yielding a t-value of 24.740). There was an individual growth need strength moderating effect on reported satisfaction with supervision.

Hypotheses 2-1 through 2-6 predicted that individuals in the experimental group whose growth need strength scores constituted the top quartile in the range of scores would react more positively to working in enriched jobs and would report significantly more experienced meaningfulness, experienced responsibility, knowledge of results, general job satisfaction, internal work motivation, and satisfaction

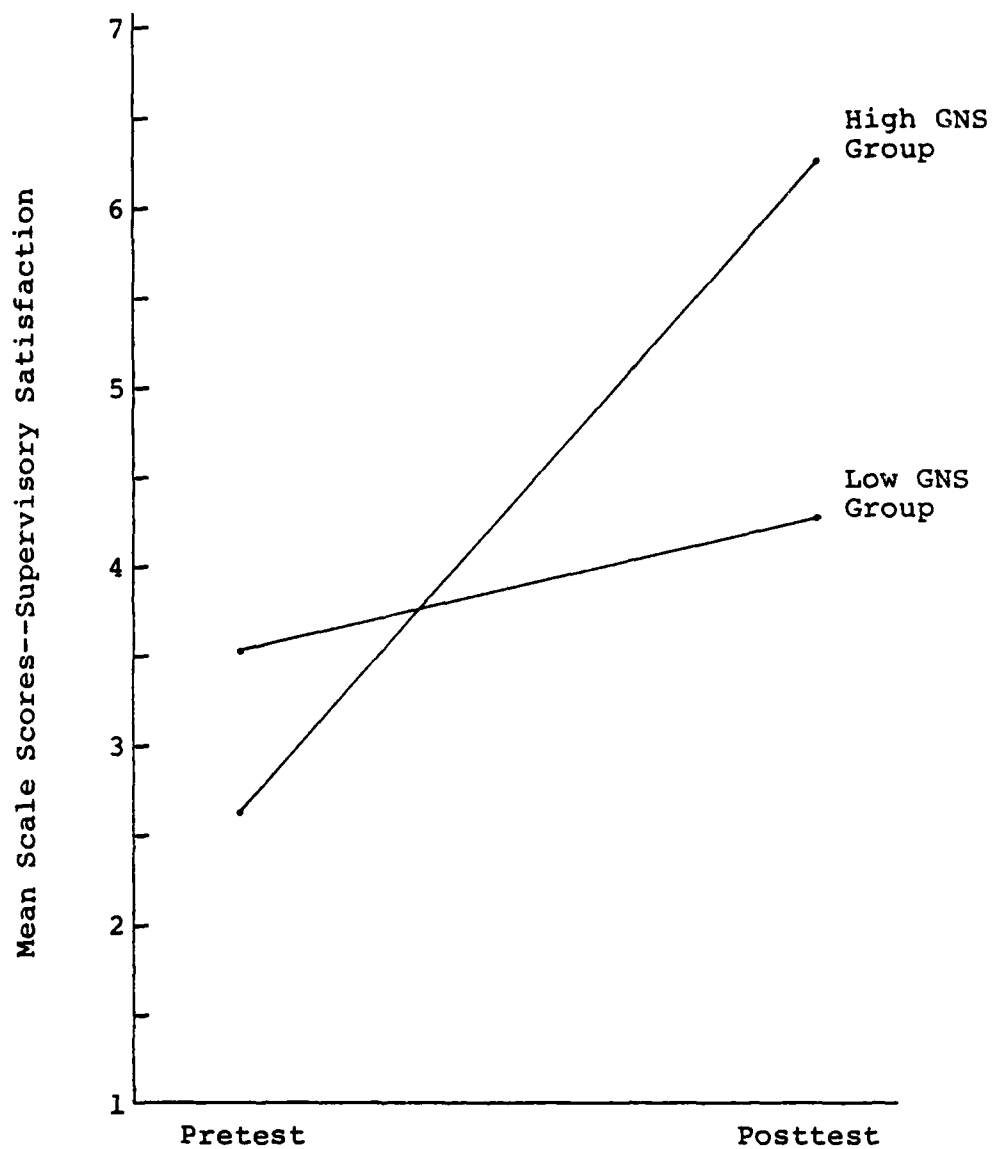


Figure 29. Comparison of Supervisory Satisfaction in High and Low Growth Need Strength Groups Before and After Work Redesign

Table 31

t-Tests for the Moderating Effect of Growth Need
Strength on Satisfaction with Supervision

Satisfaction with Supervision					
	Mean	Variance	S.D.	t-Value	
Pretest Comparison					
High GNS Group (N=10)	2.599	.796	.892	4.847	p<.001
Low GNS Group (N=10)	3.500	.517	.719		
Pretest to Posttest Changes					
High GNS Group					
Pretest	2.599	.796	.892	24.740	p<.001
Posttest	6.231	.203	.151		
Low GNS Group					
Pretest	3.500	.517	.719	3.587	p<.001
Posttest	4.298	1.364	1.168		
Posttest Comparison					
High GNS Group	6.231	.023	.151	10.118	p<.001
Low GNS Group	4.298	1.364	1.168		

with supervision than would individuals whose growth need strength scores constituted the bottom quartile. In all cases the mean scores of the high GNS group were significantly higher ($p < .001$) at the posttest than those of the low GNS group, and the high GNS group increased significantly ($p < .001$) on all variables from the pretest to the posttest. These results suggested a strong moderating effect for growth need strength. The low GNS group responded positively to work redesign also, however, by reporting significant ($p < .001$) increases on five of the six variables following the job changes. These data indicated that all workers responded positively to work redesign, but high growth need strength workers responded most positively.

Summary of the Results

The analyses of the data generally provided strong support for the Job Characteristics Model (JCM) as a theory of work redesign. The research findings also demonstrated that the reported work redesign project, which utilized the implementing principles set forth in the JCM in an ongoing, complex military organization, was successful in leading to positive personal and organizational work outcomes.

The first six hypotheses dealt with work redesign and the core job characteristics and predicted that the Marines working in the enriched job would perceive

significantly more skill variety, task identity, task significance, autonomy, and feedback from their work than the Marines whose job was not changed. These hypotheses were strongly supported by the data. The Marines in the experimental group were strongly aware of working in an enriched job, producing higher mean scores on all variables. Five of the six hypotheses showed a significant difference between the scores of the two groups at the posttest of .001 or better, and one (task identity) was significant below the .01 level.

Hypotheses 1-7 through 1-9 dealt with work redesign and the critical psychological states and predicted that the Marines working in the enriched job would report significantly more experienced meaningfulness of their work, experienced responsibility for their work, and knowledge of work results than the Marines in the control group. These hypotheses received strong support from the data with the mean scores for the experimental group being significantly greater than those of the control group at the .001 level or better on all three variables. The strong support for the psychological state hypotheses was expected given the success of the job characteristics hypotheses. The JCM predicts that jobs which are high in the core job characteristics produce feelings of meaningfulness, responsibility, and knowledge of results for the job incumbents. This prediction was verified by the reported work redesign project.

Hypotheses 1-10 through 1-14 dealt with work redesign and organizational and personal outcomes and predicted that the affective and behavioral responses of the Marines whose job was enriched would be significantly greater than those of the Marines whose job was unchanged. These hypotheses were generally supported by the research findings. The job satisfaction and internal work motivation scores of the Marines in the experimental group increased substantially and significantly ($p < .001$) from the pretest to the posttest and were significantly higher ($p < .001$) than those of the Marines in the control group at the posttest. The Marines in the experimental group were given better conduct ratings ($p < .05$) and performance evaluations ($p < .02$) by their commander following the job changes than were Marines in the control group. The work attendance hypothesis which predicted fewer occasions of absenteeism for the Marines working in the enriched job was not supported by the data.

The last six hypotheses dealt with the moderating effect of growth need strength and predicted that Marines in the experimental group with high growth need strength would react more positively to work redesign than Marines whose growth need strength was low. These hypotheses were supported by the posttest data, with high GNS individuals reporting significantly more ($p < .001$) experienced meaningfulness of the work, experienced responsibility for the work, knowledge of how effectively they performed, general

job satisfaction, internal work motivation, and satisfaction with supervision than individuals with low GNS. Because the low GNS individuals also reported significant increases in five of the six variables from pretest to posttest, the data indicated that all Marines in the experimental group responded positively to work redesign, but those with high GNS responded most positively.

Analyses of the Findings

The results from this field experiment indicated clearly that work redesign did produce substantial benefits for the employees and the organization. For instance, each of the two personal outcomes and two of the three organizational outcomes assessed in the present study were markedly improved as a result of the job changes. For personal outcomes, the levels of general job satisfaction and internal work motivation were each significantly higher among employees whose jobs were enriched than among employees whose job content was not changed. For organizational outcomes, the evaluations of employee performance and overall conduct were both significantly higher among employees whose jobs were redesigned than among employees whose jobs remained unaltered. Generally, these findings confirmed the "optimistic" predictions of Hackman and Oldham (1980) regarding work redesign.

Work Redesign and the Core
Job Characteristics

The findings concerning employee perceptions of job characteristics, coupled with the significant increase in the affective responses of employees to the enriched job, provided rather clear causal support for the argument that altering job content can lead to perceptions of greater enrichment, and that these perceptions in turn can produce more favorable employee attitudes, as reflected in higher levels of job satisfaction and internal work motivation. Hackman and Oldham (1976) tested the JCM by correlating the perceptual measures of the employees' job characteristics with the employees' own job attitudes. They justified the use of this approach by arguing that, according to the theory, it was the employees' perceptions of their jobs, rather than the objective characteristics of the jobs, which determined the employees' affective and behavioral responses to their jobs. The significant increase in employee perceptions of the five core job characteristics and the accompanying significant increase in employee job satisfaction and internal work motivation found in the present study provided strong support for the JCM and the contention that task scope and at least employee affective responses are related.

Work Redesign and the Critical
Psychological States

Although the present findings suggested that work

redesign had a strong impact on personal and work outcomes because employees perceived their jobs as more complex and varied, the findings did not, in themselves, provide explanations why this should be so. Specifically, the data on employee perceptions of task scope did not explain why the employees held favorable job attitudes. In the present work redesign project, the mean scores on all three critical psychological states also increased significantly in the experimental group and were significantly higher than those of the control group following the job changes. It is, therefore, plausible to argue, in accordance with the JCM, that work redesign was positively associated with greater employee satisfaction and internal work motivation because the enriched job (characterized by large amounts of each of the five core job characteristics) produced the three critical psychological states: experienced meaningfulness of the work, experienced responsibility for the work, and knowledge of the actual results of the work activities. The results of the work redesign project strongly supported the JCM's prediction of the mediating effect of the critical psychological states and Hackman and Oldham's (1980) contention that the critical psychological states were the causal core of the model.

Work Redesign and Organizational and Personal Outcomes

The findings of the experiment with regard to job satisfaction and internal work motivation provided strong

support for the JCM, as both measures increased significantly ($p < .001$) for the experimental group following the job changes, and both were significantly higher ($p < .001$) than the mean scores for the control group at the posttest. Hackman and Oldham (1980) indicated that MPS was an excellent predictor of job satisfaction. Therefore, the significantly large increase in MPS for the experimental group in the present study probably led to the significant increase in job satisfaction for that group. The findings of this research strongly supported the JCM prediction that work related changes which increased job characteristics led to increased job satisfaction. The effects of the work redesign project on supervisor evaluations of employee job performance and conduct were also found to be significant following the job changes, but not as strong as the affective responses of the employees. The hypothesis which predicted fewer occasions of absenteeism for members of the experimental group following work redesign was not supported by the data. The data from the present study, therefore, corroborated findings from other studies that affective responses of employees were more strongly and consistently related to work redesign than behavioral responses.

The behavioral response results require some additional explanation and discussion. First, the results concerning performance and conduct were limited in that these variables were not measured directly, but through

a surrogate measure (Detachment Commander evaluations). There were some problems associated with these supervisory evaluations which possibly confounded data analyses. The ratings appeared to suffer from problems of leniency and restriction of range. For example, as shown in Table 20, the mean scores for conduct and proficiency (performance) in both the control and experimental groups, both before and after the job changes, exceeded 4.0 on a scale to 5.0. The mean scores, as shown in Table 21, were in the "good" categories for both variables before and after the job changes, and no individual, either in the control or the experimental group, was ever rated in the "poor" category for duty performance. These lenient markings restricted the range of scores drastically and produced error variance in the performance and conduct evaluations. The problem of error variance could be partly overcome if direct indices of performance were used. This might produce more significant results.

The fact that absenteeism did not significantly decrease following the redesign of the experimental group's job presented a problem of interpretation. One would expect that when the job was motivationally improved, employees would find the workplace more attractive and would want to come to work more regularly. The fact that general job satisfaction (typically associated with absenteeism) significantly increased in the reported study following the job changes, further strengthened the expectation

that work attendance would improve. One possible explanation for why it did not might be that work redesign led to greater behavioral commitment to the work and the organization for more competent employees and to less commitment among employees who were less capable, and who felt overwhelmed by the complexity and responsibility associated with the new job. Any overall indicator of absenteeism for the work group as a whole (as in the present study) would, therefore, be misleading because of the different effects of the change on the absence rates of the two subgroups.

Work Redesign and the
Moderating Effect of
Growth Need Strength

The research findings on the moderating effect of growth need strength strongly supported the JCM. It was shown by the data analyses that the process of work redesign had a much stronger and more favorable impact on the job attitudes of employees whose growth needs were strong rather than weak. The JCM predicted that growth need strength moderated at two different points in the model: first at the link between the objective job characteristics and the psychological states, and again between the psychological states and the affective outcomes. The first link specified that people with high growth need strength would experience the psychological states more strongly when their job was high on MPS than would their low growth

need strength counterparts. The second link meant that individuals with high growth need strength would respond more positively to the psychological states than would low growth need individuals. The data strongly supported both predictions. The mean scores on each of the three psychological states were significantly higher ($p < .001$) for the high GNS group than those of the low GNS group at the posttest. Also, the high GNS group reported significantly more ($p < .001$) job satisfaction and internal work motivation than the low GNS group at the posttest. Individuals with strong needs for growth responded eagerly and positively to the opportunities provided by the redesigned work.

A strong relationship between growth need strength and supervisory satisfaction emerged from the findings of the reported research. The mean score for the high GNS group ($\bar{X} = 2.6$) on supervisory satisfaction was significantly lower ($p < .001$) than that of the low GNS group ($\bar{X} = 3.5$) at the pretest, but at the posttest, the mean score of the high GNS group ($\bar{X} = 6.2$) was significantly higher ($p < .001$) than that of the low GNS group ($\bar{X} = 4.3$). This was probably due to the fact that the redesign of the job impacted heavily on the core job characteristic of autonomy. The mean score for autonomy increased more substantially and significantly for the experimental group from pretest to posttest than any other job characteristic (from $\bar{X} = 2.42$ to $\bar{X} = 4.94$ yielding a t-value of

10.857, $p < .001$). The workers themselves were given more discretion and independence in determining how their work should be performed; they received less supervision as a result of the job changes. The high growth need strength individuals were significantly less satisfied with their supervision prior to the experiment than were the low growth need strength individuals, but they responded very favorably to the increased autonomy they perceived to be present in their job following the work redesign.

Perhaps the most interesting finding of the present study was that the low GNS group also responded positively and significantly to work redesign. This group reported significant increases on five of the six variables measured for the moderating effect of growth need strength. Growth need strength affected only how motivated and satisfied people were when their jobs were improved. Not even individuals with very weak needs for growth responded to enriching changes with dissatisfaction and reduced internal motivation. From these data one could conclude that work redesign could be employed on a widespread rather than limited basis without risking negative results. This conclusion agreed with Herzberg and his followers who posited that job enrichment should be applied nonselectively in terms of individual differences. It was opposed to Hackman and Oldham's position that individuals with low needs for growth might not recognize the existence of opportunities provided by enriched work, might not value

them, or might find them threatening and balk at being "stretched" too far by their work.

This finding requires further discussion. Perhaps Hackman and Oldham's (1976, 1980) contention would be supported by work redesign projects beginning with higher scope, more complex jobs. The present study began with an extremely simple job. The MPS for the experimental group ($\bar{X} = 33.434$) was almost three standard deviations below the mean for United States organizations ($\bar{X} = 128$) (Oldham, Hackman, and Stepina, 1979). Although the MPS for the experimental group increased significantly ($p < .001$) from the pretest to the posttest, it was still 10 points below the national norm ($\bar{X} = 118.171$ at the posttest). The job of the Marine security guard was lacking on the core job characteristics so significantly that the enrichment was welcomed by all employees. The job was probably not complex enough to "stretch" even the low growth need strength employees.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Many workers in American society want jobs that allow them to make greater use of their education, that provide intrinsic work satisfaction, and that meet their expectations that work should be meaningful. Jobs that offer little challenge or autonomy, that are dull, repetitive, and seemingly meaningless, cause discontent among workers across all occupational levels in both the public and private sectors. Increasingly, therefore, more and more organizations are turning to the redesign of work as a strategy for organizational change directed toward solving these problems and leading to more meaningful jobs and an improvement in the quality of work life.

The purpose of this research was to accomplish an independent, scientific evaluation of a work redesign project performed in an ongoing, complex highly structured, hierarchical military organization. It attempted to answer the questions of whether work redesign was possible in such a setting and to determine if the application of the Job Characteristics Model (JCM) of work redesign in a United States Marine Corps detachment would lead to positive

personal and organizational work outcomes. The JCM established the foundation for both the research questions and the implementation methods used. The JCM theory proposed that positive personal and work outcomes were obtained when three critical psychological states, created by the perceived presence of five core job characteristics, were present for a given employee. Individual differences moderated the predicted relationships both at the link between the core job characteristics and the psychological states, and between the psychological states and the outcomes. Five principles for implementing work redesign, based on the JCM, prescribed in concrete terms what to do to make jobs more motivating for the people who performed them. Each one was a specific action step aimed at improving both the quality of the working experience for individuals and their productivity.

A thorough review of the research literature concerning the JCM generally found support for the work redesign theory, but also indicated that the theoretical integration of work redesign was incomplete. Many of the studies were descriptive case studies characterized by weak experimental design, poor methodology, lack of adequate control, and inaccurate measurement. The reported study, however, was a well designed experimental field test of the JCM in a complex military organization. It used a control group, proper measures, reasonable time intervals, and statistical measures of significance to

test the variables associated with the JCM. The research was a six-month field experiment which employed a non-equivalent control group quasi-experimental design, and which investigated the perceived amount of core job characteristics and critical psychological states reported by 78 United States Marine security guards prior to and following a work redesign project. The affective and behavioral responses of the guards to work redesign in terms of general job satisfaction, internal work motivation, job performance, conduct, and absenteeism, as well as the moderating effects of individual growth need strength were also investigated. The principle instrument used in the study was the Job Diagnostic Survey (JDS), which was based on the JCM and which provided measures of the core job characteristics, the critical psychological states, the affective responses of employees to the job, and individual growth need strength. An important aspect of the research was the fact that the burden was not placed on management to identify work problems, but instead included the job incumbents in both job problem identification and job change suggestions.

The diagnostic phase of the work redesign project began with the JDS pretest and included interviews and an examination of the focal job to determine if it had potential for enrichment. The JDS data indicated that problems of job satisfaction and motivation were present and the job itself was the probable cause. The results of the interviews

and JDS growth need strength measures demonstrated that the Marines showed a desire and readiness for enriched jobs. Analysis of the JDS data indicated that changes to the job should be made along all of the core job characteristics, with special emphasis on skill variety and autonomy. Following the diagnosis, the experimental and control groups were identified.

A three-day management seminar was held for the middle and upper managers to familiarize them with leadership and management styles and with motivation and job enrichment theory. The JCM was stressed, as was a practical examination of work redesign implementation techniques and their problems. The managers were thoroughly briefed on all aspects of the planned project and their role in the project. Workshops were conducted for the experimental group's Marine guards and their section leaders to provide an orientation of the project and a review of the major concepts of the JCM and its implementing principles. The workers then participated in small groups in identifying job related problem areas. Brainstorming sessions followed, and the participants proposed ideas for solving the job related problems and enriching their jobs. The suggested changes made use of the implementing principles set forth in the JCM. Each item on the list of change proposals was examined by the supervisors and the researcher to assess its impact on the organization and on the individual Marine guards, and the means of implementation were thoroughly

discussed. The selected job changes were then implemented.

Six months after the job change implementations, the JDS posttest was administered to the control and experimental groups, absenteeism data were collected, and job performance and conduct evaluations of each Marine guard were obtained. Statistical analyses were then performed to determine the success of the work redesign project and to test the study's hypotheses.

The research findings provided very strong support for the study's hypotheses. The results of the experiment showed that the perceived amounts of the core job characteristics in the employees' job increased significantly for the experimental group from the pretest to the posttest, and were significantly higher for all five job characteristics than those of the control group at the posttest. The MPS and the critical psychological state variables all increased significantly ($p < .001$) for the experimental group and were significantly higher ($p < .001$) than those of the control group at the posttest.

The hypotheses which dealt with workers' affective responses to work redesign were also strongly supported. General job satisfaction and internal work motivation scores both increased significantly ($p < .001$) for the experimental group following the job changes, and were significantly higher ($p < .001$) than those of the control group at the posttest. The experimental group's job performance ratings increased significantly ($p < .05$) and

were significantly higher ($p < .02$) than those of the control group at the posttest. The experimental group's conduct ratings were also significantly higher ($p < .05$) than those of the control group following the work redesign. The work attendance hypothesis was not supported.

The data also provided strong support for the hypotheses dealing with growth need strength. Specifically, the research investigated the moderating effect of growth need strength on the three critical psychological states, plus job satisfaction, internal work motivation, and satisfaction with supervision. With each of the six variables, the high GNS group showed a significant increase ($p < .001$) in mean score from the pretest to the posttest and had a significantly higher ($p < .001$) mean score than the low GNS group at the posttest. Interestingly, the low GNS group also showed a significant increase ($p < .001$) on five of the six variables following the job changes.

Conclusions

The results of the present research indicated that work could be successfully redesigned so that workers were more satisfied with their jobs, more motivated to do their jobs, and more proficient on the job. In addition, it was found that workers with high growth need strength responded more positively to enriched jobs than did workers with low growth need strength. Worker participation in the

redesign of their own job was shown to be a viable approach to accomplishing work redesign. All of these findings have implications for organizational practice.

Before a work redesign project can be successfully implemented, it is mandatory that a systematic study or diagnosis of the work and workers be accomplished. Some jobs are as good or enriched as they can ever be because of structural or technological constraints. Sometimes jobs are viewed as being bad because of poor working conditions, inadequate pay, or other extrinsic factors which make work redesign unsuitable until they are corrected. Employee readiness to accept job changes and the increased demands that come with them should also be properly assessed, since individuals differ in their desire for enriched work. The JDS is a valuable measurement tool in the diagnostic process, since it measures perceived job characteristics, employee affective responses to the job, and employee readiness for change (through the growth need strength measures). The JDS can help assess whether employee problems are job-related and motivational in nature, and can aid in directing redesign efforts to those core job characteristics that are in the most need of change. The JDS can also be used in the evaluation activities aimed at assessing the effects of redesigned jobs on the employees. Whenever possible, both multiple methods and multiple observers should be employed in the diagnostic phase so that the results truly

reflect the job being studied. Thus, if reports of the properties of jobs are obtained using the JDS, those reports should be supplemented with information gathered by interviews and observations. If data from the job incumbents are obtained, then those data should be supplemented by information collected from supervisors.

Although it is complex and time consuming, the diagnostic phase is an essential prerequisite for successful work redesign and must not be skirted or compromised. There is more to work redesign than simply adding to a job. Improving jobs deserves intensive study. To shortcut the diagnostic process risks developing changes based on incomplete or incorrect understanding of the people and the work and may lead to work redesign failure.

It should be noted that a very successful work redesign project may impact favorably on employee job satisfaction and internal work motivation and seem to have no effect on performance or work attendance. This is possible because the two behavioral measures, performance effectiveness, and occasions of absenteeism, are not ideal for testing the effects of changes in the motivational properties of the work.

The performance measure does not distinguish between the quality and quantity of performance. Indeed, it may be possible that decreases in quantity may even be noted as employees work especially hard to produce high quality work. Also, every effort should be made to measure

performance as directly as possible, rather than through the evaluations of supervisors. Supervisory ratings often suffer from the problem of leniency, which drastically restricts the range of scores and produces error variance in the performance assessments. Lenient markings given prior to job changes might "mask" possible significant improvements in both the quality and quantity of work produced following the redesign of work.

The measure of absenteeism does not distinguish between voluntary and involuntary absences and fails to consider the numerous situational factors that may constrain an employee from acting on his or her intentions. Work redesign may not improve overall work attendance, for while it is possible that enriched work leads to greater behavioral commitment to the work and the organization for more competent employees, it may lead to less commitment among employees who are less capable. Absenteeism may be a problem both in routine, simple jobs, and in complex, challenging jobs, depending on the competence of the employee filling the job. For instance, the more competent employees may show higher absence rates when they have routine jobs, because they are bored. Less competent employees in complex, challenging jobs may be unhappy and more frequently absent, because they are overwhelmed by the same complexity that motivates the more competent employees. If this is true, then changes in jobs that increase the complexity of the five core job

characteristics might simultaneously prompt decreased absenteeism for more competent employees and increased absenteeism for their less competent co-workers. Any overall indicator of absenteeism for the work group as a whole would, therefore, be misleading because of the different effects of the change on the absence rates of the two subgroups. The problems associated with the performance and absenteeism measures definitely compromise their usefulness as indices of employee satisfaction and motivation.

One very important finding in the present study, and one with serious organizational implications, was that enriching the subordinates' job caused confusion for the supervisor. Autonomy, decision-making responsibility, and discretion were removed from the job of the supervisor and assigned to subordinates following work redesign. The workers took on many of the responsibilities that had been reserved for the section leaders, and the section leaders assumed some of the day-to-day supervisory functions of the Guard Chief. Such shrinkage of the responsibilities of supervisors often results in substantial negative changes in the supervisors' behavior. Appropriate attention and help must be given to the supervisors in such cases or they can become disaffected. The duties of the supervisors must be changed along with the subordinates' job so that their own work grows in meaning and responsibility. Training

employees in their new responsibilities and managing the evolution of the work redesign process itself are tasks which may be added to supervisory jobs during work redesign. Certainly, supporting autonomous work by their subordinates must become a natural part of the supervisors' job. Employees with high growth need strength experience a significant increase in supervisory satisfaction following work redesign because of an increase in the core job characteristic of autonomy. When workers are given more autonomy, discretion, and independence in determining how their work should be performed, they receive less direct supervision. The high growth need strength individuals respond positively to this situation by reporting an increase in their satisfaction with supervision.

The reported research demonstrated that individuals with high growth need strength responded more positively to redesigned work than did individuals with low growth need strength. However, the low growth need strength employees also responded positively and significantly to the work redesign. This was probably true because the project focused on a relatively simple, low scope job. In an organizational setting characterized by jobs low in task scope, therefore, work redesign can be applied nonselectively in terms of individual differences. It can be employed on a widespread rather than limited basis without risking negative results. In an organization with higher scope, more complex jobs, however, if a choice must

be made between enriching different jobs of equal motivating potential, the decision as to which job to redesign should be based upon the growth need strength of the individual workers. Growth need strength also has implications for work assignment. Individuals with high growth need strength, and who are qualified, might be assigned enriched jobs with high motivating potential. Individuals with low growth need strength might best be assigned jobs that structural and technological constraints prevent from being redesigned.

Worker participation in problem identification and job change suggestions was a very positive force in this work redesign project. Herzberg and his associates argued that workers themselves were not qualified or in a good position to take part in changing their jobs and that whenever they did, the results were disappointing. The present research demonstrated that the workers themselves were a valuable part of the work redesign procedure and a resource that should not be overlooked. The employees were very receptive to the job changes because they had a part in making the changes. The project was probably more successful than it would have been had they been ordered to assume additional responsibility by an outside expert. The results, then, of participative work redesign were very promising. It must be emphasized, however, that a qualified work redesign expert should diagnose, plan, monitor, guide, and evaluate any work redesign project to ensure that the significant core job characteristics are

actually improved and that the work itself is enriched.

In summary, the present research suggests that work redesign can be employed by organizations to increase job satisfaction and internal work motivation, and to improve employee conduct and job performance. In addition, workers can successfully participate in determining how their jobs should be changed. Individual growth need strength is a good measure of an employee's psychological readiness for enriched work and also has implications for job diagnosis, employee selection, and organizational staffing.

The results of the reported study also had theoretical implications. The research provided substantial support for the Job Characteristics Model of work motivation by testing it in a dynamic work organization using a homogeneous group of employees working on a low scope job. It supported the model's predictions that employees' perceptions of the core job characteristics led to their affective responses to the job; that the critical psychological states played an important mediating role between the job characteristics and the outcomes; and that growth need strength had a moderating effect at two links in the model. One theoretical suggestion from the present study concerns the categorization of variables within the Job Characteristics Model. Internal work motivation might be better considered as a critical psychological state rather than as an outcome variable. Also, absence, and

perhaps performance might be better explained as components of a fourth stage of the model, dependent on job satisfaction. An additional suggestion deals with individual difference moderators. The model assumes that growth need strength moderates all the relationships between the various job characteristics and their associated psychological states, as well as the psychological states and the personal and work outcomes. This may be too much to expect from a single construct. A different approach would be to introduce different moderators for different parts of the theory. For example, the hypothesized relationship between autonomy and experienced responsibility for the work may be strongly moderated by growth need strength, but this individual difference variable may have very little impact on the relationship between task significance and experienced meaningfulness of the work. This relationship, may, however, be strongly influenced by a different individual difference moderator. This is possible because different job characteristics may arouse different motives and satisfy different needs. Attention should be paid to any reformulations of the model which might lead to a theoretical framework more consistent with empirical evidence.

Recommendations

Further work redesign research should examine a wider range of individual factors which potentially

influence the way employees respond to their jobs. The present study did not investigate the moderating effect of growth need strength on performance and absenteeism; future research should investigate these relationships. A logical extension of moderator study should also include research on the possible moderating effect of environmental factors such as organizational structure, technology, leadership, and the social system that houses the job and employees under investigation.

Virtually all research tested for the relationship between work redesign and worker responses. It is possible that jobs that are expanded too much can lead to negative responses by the job incumbents. Future research should examine high scope jobs and should investigate the relationship between employee competence and work redesign, with a special emphasis on the relationships between work redesign, employee competence, and work attendance (absenteeism). More research is also necessary to track employee response to work redesign over extended periods of time so that the long term results of work redesign can be better understood.

Finally, most research studies investigated the workers' affective responses to work redesign and assessed how the job changes influenced their satisfaction with supervision. Very little has been accomplished regarding the response of supervisors to the changes in their subordinates' jobs. Future research should also consider the supervisor's affective response to redesigned work.

APPENDIXES

APPENDIX A. The Job Diagnostic Survey

JOB DIAGNOSTIC SURVEY

This questionnaire was developed as part of a Yale University study of jobs and how people react to them. The questionnaire helps to determine how jobs can be better designed, by obtaining information about how people react to different kinds of jobs.

On the following pages you will find several different kinds of questions about your job. Specific instructions are given at the start of each section. Please read them carefully. It should take no more than 25 minutes to complete the entire questionnaire. Please move through it quickly.

The questions are designed to obtain your perceptions of your job and your reactions to it.

There are no trick questions. Your individual answers will be kept completely confidential. Please answer each item as honestly and frankly as possible.

Thank you for your cooperation.

SECTION ONE

This part of the questionnaire asks you to describe your job, as objectively as you can.

Please do not use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

A sample question is given below.

A. To what extent does your job require you to work with mechanical equipment?

1-----2-----3-----4-----5-----6-----7

Very little; the job requires almost no contact with mechanical equipment of any kind.

Moderately

Very much; the job requires almost constant work with mechanical equipment

You are to circle the number which is the most accurate description of your job.

If, for example, your job requires you to work with mechanical equipment a good deal of the time--but also requires some paperwork--you might circle the number six, as was done in the example above.

If you do not understand these instructions, please ask for assistance. If you do understand them, turn the page and begin.

1. To what extent does your job require you to work closely with other people (either "clients," or people in related jobs in your own organization)?

1-----2-----3-----4-----5-----6-----7

Very little, dealing with other people is not at all necessary in doing the job.

Moderately; some dealing with others is necessary.

Very much; dealing with other people is an absolutely essential and crucial part of doing the job.

2. How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

1-----2-----3-----4-----5-----6-----7

Very little; the job gives me almost no personal "say" about how and when the work is done.

Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work.

Very much; the job gives me almost complete responsibility for deciding how and when the work is done.

3. To what extent does your job involve doing a "whole" and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

1-----2-----3-----4-----5-----6-----7

My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service.

My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome.

My job involves doing the whole piece of work, from start to finish; the results of my activities are easily seen in the final product or service.

4. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?

1-----2-----3-----4-----5-----6-----7

Very little; the job requires me to do the same routine things over and over again.

Moderate variety.

Very much; the job requires me to do many different things, using a number of different skills and talents.

5. In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

1-----2-----3-----4-----5-----6-----7

Not very significant; the outcomes of my work are not likely to have important effects on other people.

Moderately significant.

Highly significant; the outcomes of my work can affect other people in very important ways.

6. To what extent do managers or co-workers let you know how well you are doing on your job?

1-----2-----3-----4-----5-----6-----7

Very little; people almost never let me know how well I am doing.

Moderately; sometimes people may give me "feedback"; other times they may not.

Very much; managers or co-workers provide me with almost constant "feedback" about how well I am doing.

7. To what extent does doing the job itself provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing--aside from any "feedback" co-workers or supervisors may provide?

1-----2-----3-----4-----5-----6-----7

Very little; the job itself is set up so I could work forever without finding out how well I am doing.

Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not.

Very much; the job is set up so that I get almost constant "feedback" as I work about about how well I am doing.

SECTION TWO

Listed below are a number of statements which could be used to describe a job.

You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Once again, please try to be as objective as you can in deciding how accurately each statement describes your job--regardless of whether you like or dislike your job.

Write a number in the blank beside each statement, based on the following scale:

How accurate is the statement in describing your job?

1	2	3	4	5	6	7
Very	Mostly	Slightly	Uncertain	Slightly	Mostly	Very
Inaccurate	Inaccurate	Inaccurate		Accurate	Accurate	Accurate

- ___ 1. The job requires me to use a number of complex or high-level skills.
- ___ 2. The job requires a lot of cooperative work with other people.
- ___ 3. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.
- ___ 4. Just doing the work required by the job provides many chances for me to figure out how well I am doing.
- ___ 5. The job is quite simple and repetitive.
- ___ 6. The job can be done adequately by a person working alone--without talking or checking with other people.
- ___ 7. The supervisors and co-workers on this job almost never give me any "feedback" about how well I am doing in my work.
- ___ 8. The job is one where a lot of other people can be affected by how well the work gets done.
- ___ 9. The job denies me any chance to use my personal initiative or judgment in carrying out the work.
- ___ 10. Supervisors often let me know how well they think I am performing the job.
- ___ 11. The job provides me the chance to completely finish the pieces of work I begin.

- ___ 12. The job itself provides very few clues about whether or not I am performing well.
- ___ 13. The job gives me considerable opportunity for independence and freedom in how I do the work.
- ___ 14. The job itself is not very significant or important in the broader scheme of things.

SECTION THREE

Now please indicate how you personally feel about your job.

Each of the statements below is something that a person might say about his or her job. You are to indicate your own personal feelings about your job by marking how much you agree with each of the statements.

Write a number in the blank for each statement, based on this scale:

How much do you agree with the statement?

1	2	3	4	5	6	7
Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly

- ___ 1. It's hard, on this job, for me to care very much about whether or not the work gets done right.
- ___ 2. My opinion of myself goes up when I do this job well.
- ___ 3. Generally speaking, I am very satisfied with this job.
- ___ 4. Most of the things I have to do on this job seem useless or trivial.
- ___ 5. I usually know whether or not my work is satisfactory on this job.
- ___ 6. I feel a great sense of personal satisfaction when I do this job well.
- ___ 7. The work I do on this job is very meaningful to me.
- ___ 8. I feel a very high degree of personal responsibility for the work I do on this job.
- ___ 9. I frequently think of quitting this job.
- ___ 10. I feel bad and unhappy when I discover that I have performed poorly on this job.

- ___ 11. I often have trouble figuring out whether I'm doing well or poorly on this job.
- ___ 12. I feel I should personally take the credit or blame for the results of my work on this job.
- ___ 13. I am generally satisfied with the kind of work I do in this job.
- ___ 14. My own feelings generally are not affected much one way or the other by how well I do on this job.
- ___ 15. Whether or not this job gets done right is clearly my responsibility.

SECTION FOUR

Now please indicate how satisfied you are with each aspect of your job listed below. Once again, write the appropriate number in the blank beside each statement.

1	2	3	4	5	6	7
Extremely	Dissatis-	Slightly	Neutral	Slightly	Satisfied	Extremely
Dissatis-	fied	Dissatis-		Satisfied		Satisfied
fied		fied				

- ___ 1. The amount of job security I have.
- ___ 2. The amount of pay and fringe benefits I receive.
- ___ 3. The amount of personal growth and development I get in doing my job.
- ___ 4. The people I talk to and work with on my job.
- ___ 5. The degree of respect and fair treatment I receive from my boss.
- ___ 6. The feeling of worthwhile accomplishment I get from doing my job.
- ___ 7. The chance to get to know other people while on the job.
- ___ 8. The amount of support and guidance I receive from my supervisor.
- ___ 9. The degree to which I am fairly paid for what I contribute to this organization.
- ___ 10. The amount of independent thought and action I can exercise in my job.

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- ___ 11. How secure things look for me in the future in this organization.
- ___ 12. The chance to help other people while at work.
- ___ 13. The amount of challenge in my job.
- ___ 14. The overall quality of the supervision I receive in my work.

SECTION FIVE

Now please think of the other people in your organization who hold the same job you do. If no one has exactly the same job as you, think of the job which is most similar to yours.

Please think about how accurately each of the statements describes the feelings of those people about the job.

It is quite all right if your answers here are different from when you described your own reactions to the job. Often different people feel quite differently about the same job.

Once again, write in the blank for each statement, based on this scale:

How much do you agree with the statement?

1	2	3	4	5	6	7
Disagree	Disagree	Disagree	Neutral	Agree	Agree	Agree
Strongly		Slightly		Slightly		Strongly

- ___ 1. Most people on this job feel a great sense of personal satisfaction when they do the job well.
- ___ 2. Most people on this job are very satisfied with the job.
- ___ 3. Most people on this job feel that the work is useless or trivial.
- ___ 4. Most people on this job feel a great deal of personal responsibility for the work they do.
- ___ 5. Most people on this job have a pretty good idea of how well they are performing their work.
- ___ 6. Most people on this job find the work very meaningful.
- ___ 7. Most people on this job feel that whether or not the job gets done right is clearly their own responsibility.
- ___ 8. People on this job often think of quitting.

- ____ 9. Most people on this job feel bad or unhappy when they find that they have performed the work poorly.
- ____ 10. Most people on this job have trouble figuring out whether they are doing a good or a bad job.

SECTION SIX

Listed below are a number of characteristics which could be present on any job. People differ about how much they would like to have each one present in their own jobs. We are interested in learning how much you personally would like to have each one present in your job.

Using the scale below, please indicate the degree to which you would like to have each characteristic present in your job.

NOTE: The numbers on this scale are different from those used in previous scales.

4	5	6	7	8	9	10
Would like			Would like			Would like
having this			having this			having this
only a			very much			<u>extremely</u>
moderate						much
amount						
(or less)						

- ____ 1. High respect and fair treatment from my supervisor.
- ____ 2. Stimulating and challenging work.
- ____ 3. Chances to exercise independent thought and action in my job.
- ____ 4. Great job security.
- ____ 5. Very friendly co-workers.
- ____ 6. Opportunities to learn new things from my work.
- ____ 7. High salary and good fringe benefits.
- ____ 8. Opportunities to be creative and imaginative in my work.
- ____ 9. Quick promotions.
- ____ 10. Opportunities for personal growth and development in my job.
- ____ 11. A sense of worthwhile accomplishment in my work.

SECTION SEVEN

People differ in the kinds of jobs they would most like to hold. The questions in this section give you a chance to say just what it is about a job that is most important to you.

For each question, two different kinds of jobs are briefly described. You are to indicate which of the jobs you personally would prefer--if you had to make a choice between them.

In answering each question, assume that everything else about the jobs is the same. Pay attention only to the characteristics actually listed.

Two examples are given below.

JOB A

A job requiring work with mechanical equipment most of the day.

JOB B

A job requiring work with other people most of the day.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

If you like working with people and working with equipment equally well, you would circle the number 3, as has been done in this example.

* * * * *

Here is another example. This one asks for a harder choice--between two jobs which both have some undesirable features.

JOB A

A job requiring you to expose yourself to considerable physical danger.

JOB B

A job located 200 miles from your home and family.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

If you would slightly prefer risking physical danger to working far from your home, you would circle number 2, as has been done in the example.

Please ask for assistance if you do not understand how to do these questions.

JOB A

JOB B

1. A job where the pay is good.

A job where there is considerable opportunity to be creative and innovative.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

2. A job where you are often required to make important decisions.

A job with many pleasant people to work with.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

3. A job in which greater responsibility is given to those who do the best work.

A job in which greater responsibility is given to loyal employees who have the most seniority.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

4. A job in an organization which is in financial trouble--and might have to close down within the year.

A job in which you are not allowed to have any say whatever in how your work is scheduled, or in the procedures to be used in carrying it out.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

5. A very routine job.

A job where your co-workers are not very friendly.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

JOB A

JOB B

6. A job with a supervisor who is often very critical of you and your work in front of other people.

A job which prevents you from using a number of skills that you worked hard to develop.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

7. A job with a supervisor who respects you and treats you fairly.

A job which provides constant opportunities to learn new and interesting things.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

8. A job where there is a real chance you could be laid off.

A job with very little chance to do challenging work.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

9. A job in which there is a real chance for you to develop new skills and advance in the organization.

A job which provides lots of vacation time and an excellent fringe benefit package.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

10. A job with little freedom and independence to do your work in the way you think best.

A job where the working conditions are poor.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

JOB A

JOB B

11. A job with very satisfying teamwork.

A job which allows you to use your skills and abilities to the fullest extent.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

12. A job which offers little or no challenge.

A job which requires you to be completely isolated from co-workers.

1-----2-----3-----4-----5

Strongly
Prefer A

Slightly
Prefer A

Neutral

Slightly
Prefer B

Strongly
Prefer B

(Hackman and Oldham, 1980:276-93).

BIOGRAPHICAL DATA

All information in this section will be held in the strictest confidence; no one in your organization will have access to your individual responses.

1. SEX: MALE _____ FEMALE _____

2. AGE (check one):

_____ Under 20

_____ 30-34

_____ 20-24

_____ 35-39

_____ 25-29

_____ 40 or over

3. MARITAL STATUS: SINGLE _____ MARRIED _____ DIVORCED _____

4. NUMBER OF CHILDREN: _____

5. ETHNIC ORIGIN (check one):

_____ WHITE

_____ AMERICAN INDIAN

_____ BLACK

_____ HISPANIC

_____ ASIAN

OTHER

6. EDUCATION(check highest level);

- | | |
|---|---|
| <input type="checkbox"/> Eighth grade or less | <input type="checkbox"/> Two-year college degree |
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Four-year college degree |
| <input type="checkbox"/> High school diploma | <input type="checkbox"/> Some graduate work |
| <input type="checkbox"/> Some college | <input type="checkbox"/> Masters or higher degree |

7. RANK/GRADE: _____

8. MOS: _____

9. TIME IN SERVICE: _____ YEARS _____ MONTHS

10. TIME AT MARDET MIRAMAR: _____ YEARS _____ MONTHS

11. RESIDENCE: BARRACKS _____ ON-BASE _____ OFF-BASE _____

12. CHILDHOOD RESIDENCE: CITY _____ SUBURB _____ RURAL _____

Note: The posttest was identical to the pretest except that item number 12 was changed to the following:

12. DID YOU COMPLETE THIS QUESTIONNAIRE IN JULY? YES _____ NO _____

APPENDIX B. Scoring Key for the Job Diagnostic
Survey and the Job Rating Form

SCORING KEY FOR THE JOB DIAGNOSTIC SURVEY
AND THE JOB RATING FORM

The scoring manual for the Job Diagnostic Survey (JDS) and the Job Rating Form (JRF) is presented below. For each variable measured by the JDS, the questionnaire items that are averaged to yield a summary score for the variable are listed.

I. JOB CHARACTERISTICS

- A. Skill variety. Average the following items:
Section One: #4
Section Two: #1
 #5 (reversed scoring--i.e., subtract
 number entered by the respondent
 from 8)
- B. Task identity. Average the following items:
Section One: # 3
Section Two: #11
 # 3 (reversed scoring)
- C. Task significance. Average the following items:
Section One: # 5
Section Two: # 8
 #14 (reversed scoring)
- D. Autonomy. Average the following items:
Section One: # 2
Section Two: #13
 # 9 (reversed scoring)
- E. Feedback from the job itself. Average the following items:
Section One: # 7
Section Two: # 4
 #12 (reversed scoring)
- F. Feedback from agents. Average the following items:
Section One: # 6
Section Two: #10
 # 7 (reversed scoring)
- G. Dealing with others. Average the following items:
Section One: #1
Section Two: #2
 #6 (reversed scoring)

II. EXPERIENCED PSYCHOLOGICAL STATES. Each of the three constructs are measured both directly (Section Three) and indirectly, via projective-type items (Section Five).

- A. Experienced meaningfulness of the work. Average the following items:
 Section Three: #7
 #4 (reversed scoring)
 Section Five: #6
 #3 (reversed scoring)
- B. Experienced responsibility for the work. Average the following items:
 Section Three: #8, #12, #15
 #1 (reversed scoring)
 Section Five: #4, #7
- C. Knowledge of results. Average the following items:
 Section Three: # 5
 #11 (reversed scoring)
 Section Five: # 5
 #10 (reversed scoring)

III. AFFECTIVE OUTCOMES. The first two constructs (general satisfaction and internal work motivation) are measured both directly (Section Three) and indirectly (Section Five); growth satisfaction is measured only directly (Section Four).

- A. General satisfaction. Average the following items.
 Section Three: #3, #13
 #9 (reversed scoring)
 Section Five: #2
 #8 (reversed scoring)
- B. Internal work motivation. Average the following items:
 Section Three: # 2, #6, #10
 #14 (reversed scoring)
 Section Five: # 1, #9
- C. Growth satisfaction. Average the following items:
 Section Four: #3, #6, #10, #13

IV. CONTEXT SATISFACTIONS. Each of these short scales uses items from Section Four only.

- A. Satisfaction with job security. Average items #1 and #11 of Section Four.
- B. Satisfaction with compensation (pay). Average items #2 and #9 of Section Four.

- C. Satisfaction with co-workers. Average items #4, #7, and #12 of Section Four.
- D. Satisfaction with supervision. Average items #5, #8, and #14 of Section Four.
- V. INDIVIDUAL GROWTH NEED STRENGTH. The questionnaire yields two separate measures of growth need strength, one from Section Six (the "would like" format) and one from Section Seven (the "job choice" format).
- A. "Would like" format (Section Six). Average the six items from Section Six listed below. Before averaging, subtract 3 from each item score; this will result in a summary scale ranging from one to seven. The items are: #2, #3, #6, #8, #10, #11
- B. "Job choice" format (Section Seven). Each item from Section Seven yields a number from 1-5 (i.e., "Strongly prefer A" is scored 1; "Neutral" is scored 3; a "Strongly prefer B" is scored 5). Compute the strength measure by averaging the twelve items as follows:
 #1, #5, #7, #10, #11, #12 (direct scoring)
 #2, #3, #4, #6, #8, #9 (reversed scoring--i.e., subtract the respondent's score from 6)
 Note: To transform the job choice summary score from a 5-point scale to a 7-point scale, use this formula:
 $Y = 1.5X - .5$.
- C. Combined growth need strength score. To obtain an overall estimate of growth need strength based on both "would like" and "job choice" data, first transform the "job choice" summary score to a 7-point scale (using the formula given above), and then average the "would like" and the transformed "job choice" summary scores.

VI. MOTIVATING POTENTIAL SCORE.

$$\text{Motivating potential score (MPS)} = \left[\text{Skill variety} + \text{Task identity} + \text{Task significance} \right] \times \text{Autonomy} \times \text{Feedback from the job}$$

(Hackman and Oldham, 1980:303-06).

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